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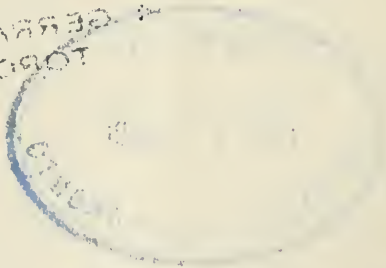
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JANUARY, 1885.

ADVANCES IN THE INSTRUCTION AND REQUIREMENTS AT THE PHILADELPHIA COLLEGE OF PHARMACY.

BY JOSEPH P. REMINGTON.

A very general desire, on the part of the friends of pharmaceutical progress and the graduates of this College, to be made acquainted with the details of the recent changes made in the requirements for pursuing the courses of instruction, and on the part of the students to know something of the earlier history of the College, has resulted in the preparation of the following brief records of progress; which, whilst not attempting to thoroughly cover all of matters of interest occurring within the times treated of, will probably serve to throw some light upon the interesting period embraced in the last two decades of the history of the "first institution established in America for disseminating a knowledge of Pharmacy." The early years of the College were marked by trials and difficulties, common to the career of all similar efforts to elevate an art or profession, into which many abuses had crept.

Apathy and indifference, or downright opposition, on the part of the majority of the druggists of the city, was then the rule; but the self-sacrificing efforts of such men as Charles Marshall, Daniel B. Smith, Henry Troth, Peter Lehman, Charles Ellis, Stephen North, Peter Williamson, Samuel F. Troth, our President, Dillwyn Parrish, and others saved the life of the young College.

As years rolled on, the institution gained strength, the greatest improvement being shown, however, during the last twenty years. The appreciation of the opportunities extended for pharmaceutical advancement by the pharmacists of the United States may be shown by the number of matriculants who have enrolled their names during this time; and, with the view of showing the record as condensed as possible, the tabular form has been adopted.

Year.	Notes and College Events.	Number of matriculants.	Percentage of matriculants from Pennsylvania and neighboring States.	Percentage of matriculants from distant States and countries.
1860.....	Faculty at this time: Prof. Bridges, Prof. Procter, Prof. Thomas.....	125	78	22
1861.....	Opening year of the Civil War.....	121	77	23
1862.....	Falling off of the Class.....	91	88	12
1863.....	Dark days of the War.....	74	91	9
1864.....	Death of Prof. Thomas; Election of Prof. Parrish; slight recovery in attendance from effects of the War.....	93	86	14
1865.....	Founding of the Alumni Association; gradual increase in attendance.....	104	84	16
1866.....	Prof. Procter resigned; Prof. Maisch elected to chair of Pharmacy.....	133	80	20
1867.....	Transfer of chair of Pharmacy to Prof. Parrish, and Materia Medica to Prof. Maisch; Summer Course in Botany established.....	154	80	20
1868.....	Old College building on Filbert street sold; new building on Tenth street erected.....	152	80	20
1869.....	Fees for College tickets increased 50 per cent.; attendance increased.....	179	79	21
1870.....	College Laboratory established; Prof. Maisch appointed Director.....	197	79	21
1871.....	Oral examinations for candidates for graduation abandoned; systematic written examinations substituted.....	198	70	30
1872.....	Increased accommodation provided for students; death of Prof. Parrish; re-election of Prof. Procter..	237	65	35
1873.....	Certificate of Proficiency in Chemistry and Materia Medica issued to graduates from wholesale stores.....	203	68	32
1874.....	Death of Prof. Procter; Prof. Remington elected.....	251	70	30
1875.....	Increased attendance; improvements in lecturing facilities.....	270	67	33
1876.....	Centennial Year; first presentation of Procter Prize..	294	63	37
1877.....	Opening of Operative Pharmacy Course; Prof. Remington, Director; examinations in Practical Pharmacy inaugurated.....	265	63	37
1878.....	Graded Course; Junior and Senior established; office of Actuary created; Thomas S. Wiegand elected.....	316	69	31
1879.....	Resignation of Prof. Bridges; election of Prof. Sadtler	334	72	28
1880.....	Professor's Prizes instituted; property on Elwyn street purchased.....	332	69	31

Year.	Notes and College Events.	Number of matriculants.	Percentage of matriculants from Pennsylvania and neighboring States.	Percentage of matriculants from distant States and countries.
1881.....	New building erected on Elwyn street, doubling the facilities; Assistants to the Professors appointed to review the lectures; Prof. Power elected Director of Chemical Laboratory; Class instruction in Analytical Chemistry established.....	367	64	36
1882.....	Practical Course in Microscopy instituted by the Alumni Association; A.P. Brown, Ph.G., Instructor	370	68	32
1883.....	Prof. Power resigned; Prof. Trimble elected to assist Prof. Sadler in direction of Chemical Laboratory....	443	67	33
1884.....	Preliminary Junior Examinations established.....	543	63	37

The figures in this table show a steady and gratifying increase, the percentage columns indicate the gradual evolution (somewhat intermittent, it is true), which shows the *national* growth of the College, the percentage of matriculants from distant States and Territories being 22 per cent. in 1860 and 33 per cent. in 1883; the highest figures being exceeded in 1884 and 1876, the Centennial year, when 37 per cent. was reached, and the lowest percentage of distant matriculants was shown in 1863, when 9 per cent. is recorded, this during the civil war. A further examination of the table will reveal the effect of each advanced step taken in the course of instruction. As progress was made, and the standard rapidly elevated, a check in the growth of the class may be noticed in the year immediately following, but in the succeeding year the increase is evident, and the check shown to be but temporary. The twenty-five years noted in the table beginning with 1860, give a fair indication of the educational labors of the College.

The beginning of that notable decade in our national history which embraced the great struggle for the supremacy of our Union, found the Philadelphia College of Pharmacy in a growing and prosperous condition, the debt on the old building on Filbert street was being gradually extinguished, the finances were carefully husbanded, and the Sinking Fund gradually increased under the persistent care and watchfulness of the chairman, Samuel F. Troth. The breaking out of the war, checked at once the growth of the classes, and in the three

years succeeding (1862, 1863 and 1864) the great and stirring events of these memorable times greatly overshadowed, in interest, the lesser circumstance of obtaining an education.

The close of the war was marked by an event of great importance to the interests of the College; in 1865 the Alumni Association was founded, and this organization proved to be in subsequent years a great element of strength to the Institution. The year 1866 was also a memorable year, Professor Procter at that time, the acknowledged leader in his profession, felt obliged on account of ill health to resign his Chair of Theory and Practice of Pharmacy. He was succeeded by Professor John M. Maisch; the entrance of Professor Maisch into the Faculty was announced in the "*American Journal of Pharmacy*" by Professor Procter with the following notice: "We know of no one who can bring to the task involved in this appointment so large a share of practical and theoretical knowledge as Professor Maisch, and we doubt not, he will give his best efforts to the promotion of the school, and the advancement of the important branch, he has been chosen to illustrate."

In the year following (1867) a transfer of chairs was made between Professors Parrish and Maisch—the subject of theoretical and practical Pharmacy was more congenial to the tastes of Professor Parrish than that of *Materia Medica*, and the zeal and ability which has since characterized the labors of Professor Maisch in the department of *Materia Medica* leave no room for doubt that the transfer was thoroughly satisfactory on his part. The title of the Chair was now changed by the addition of the word "*Botany*" to "*Materia Medica and Botany*," and the significance of this change is appreciated by the junior student even to the present day. In the same year a summer course in Botany was established. At this time the inadequacy of the accommodations of the building on Filbert street became so apparent that an improvement was imperatively demanded. A building committee was appointed, the old building on Filbert street was sold and a much larger edifice on Tenth street erected. Although the friends of the College nobly responded to the call for pecuniary assistance in aid of the building fund, it was found necessary in the year 1869 to raise the fees for College tickets in order to meet the increased expenses of carrying on the instruction. The fears of some of the members of the College that this would greatly decrease the attendance were proved to be groundless, for the attendance was not even temporarily decreased,

but on the other hand it increased 18 per cent. The year 1870 was marked by the establishment of a College laboratory and the election of Professor Maisch to the directorship. The long cherished wish of the younger members of the College and of the Alumni was thus accomplished as the following resolutions adopted by the Alumni Association, five years before (1865) clearly show :

WHEREAS, As graduates of a time-honored Institution, we feel the warmest interest in its future welfare and usefulness, and deem it no less a privilege than a duty to use every effort to secure for our Alma Mater the position to which she is entitled, and

WHEREAS, Many of us have long cherished the idea of establishing a Practical School in connection with our College, where the branches of Pharmacy and Chemistry might be more thoroughly acquired, therefore,

Be it Resolved, That a Sinking Fund be created for this purpose, out of the surplus funds of the Association ; and that a committee be appointed by the Executive Board, to be known as the Trustees of Sinking Fund, whose duty it shall be to take charge of and solicit subscriptions to this fund, and invest the same as they may judge safe and profitable, until a sufficient amount shall have been acquired to aid in the accomplishment of the end in view.

In the next year 1871 the method of conducting examinations, orally, which had been in operation for nearly half a century, was abandoned, and thus passed away, one of the most imperfect methods of examination that was ever devised. Although the oral examination of the candidates was conducted by the Faculty and Committee of Examination in a fearless and conscientious manner, the faults of the *method* were too apparent to be overlooked, and it had to give way to a systematic plan whereby each student wrote the answers to the same questions upon paper and handed in the results within a given time. Professor Parrish who had long advocated this change in the method of examination did not live long enough to witness its advantages—he died during the next year. 1872 witnessed the recall of Professor Procter from the period of rest that he had enjoyed, and he was re-elected to the old chair, that he had resigned in 1866, his health, however, had not been re-established, he passed away suddenly on the 11th day of February, 1874. The present Professor of Pharmacy was elected in the same year to fill the vacant chair.

1876, the Centennial year, was a memorable one for the College—the building was thrown open to pharmaceutical visitors and strangers, the cabinet received many valuable accessions and the class was con-

siderably increased. In 1877 the present Operative Pharmacy course was inaugurated; the course was optional, and at first the number of students who accepted the opportunities was small, and the facilities were limited. Professor Maisch tendered the use of the chemical laboratory on certain afternoons, and the course was conducted by the Professor of Pharmacy. The examinations which had each year increased in severity, received in 1877 an additional impulse in the inauguration of the examinations in practical manipulations; this advance was deemed necessary, in order that the worth of the graduates of the College should be enhanced, by compelling them to pay especial attention to excellence in conducting pharmaceutical operations, and it had the effect of at once improving the practical worth of all students who attended the College. A great advance was made in 1878 when the graded course of lectures was established. The following extract from the minutes of the Board of Trustees fully sets forth the changes:

1. The instruction to the junior and senior students will be arranged, with perhaps slight modifications, according to the plan which received the sanction of the "Conference of the Schools of Pharmacy" in 1876 (see "*Amer. Jour. of Phar.*," 1876, p. 471); in the junior department, therefore the elementary branches will be taught, which will hereafter be omitted from the senior course, thus affording more time in the latter for necessary details and a more extended range of instruction.

2. There will be six lecture hours per week for each class, the same as for the undivided class heretofore. The lectures to the two classes will be on alternate days so as to afford the professors ample time for preparing the necessary specimens, apparatus and experiments in illustration of the lectures.

3. Near the close of February an examination of the junior students will be held; the examination for the degree of Ph.G. will, as heretofore, take place early in March.

4. For admission to the senior course the juniors will be required to successfully pass the examination in each branch; those failing in one or more branches in February, will be granted another examination towards the end of September previous to the beginning of the lectures. Students who have attended one course of instruction in some other College of Pharmacy, before entering the senior course, will be required to prove that they have passed, at such college, an examination in all the branches taught to the juniors, or submit to the examination in the autumn.

5. Students who, previous to the beginning of the lectures in October next, may have attended one full course of lectures in this or another College of Pharmacy, will be entitled to admission to the senior course without previous examination, up to and including the lecture course for 1880-1881.

It will be observed that the adopted modification will vastly increase the

labors of the Professors, but at the same time afford the students still greater inducements for systematic study and the opportunity of obtaining a more thorough professional education than heretofore.

Probably no change has ever been made in the college methods, which has proved so thoroughly satisfactory as this, the scope of the instruction in each department was doubled, and the student found that from the opening lecture, the instruction grew in depth, character and extent, until the closing one was reached. The effects upon the class were immediate and of great benefit. The increased attendance of students made it necessary in this year for the College to create the office of Actuary; Thomas S. Wiegand being elected to this important position. In 1879 the greatly respected Senior Professor Dr. Bridges, was compelled on account of ill health to resign his active duties. The Chair of Chemistry was filled by the election of Prof. Sadtler, the present incumbent. The wisdom of this appointment has never been questioned. The growth of the classes, and particularly those of the optional courses, Pharmacy and Chemistry, caused the Board of Trustees to consider some means for the enlargement of teaching facilities. Fortunately, the properties in the rear could be purchased, and plans were made and estimates furnished for the erection of a four story building, adjoining the one which had been in use for eleven years, and which the classes had outgrown. This was accomplished in 1881 and the capacity of the College was thereby doubled. A special room was set apart for the Pharmaceutical laboratory adjoining the Pharmacy Lecture Room, and the Chemical Laboratory was enlarged and refitted. Professor Power was elected Director, and the system of class instruction in Analytical Chemistry was inaugurated. The year 1882 witnessed another advance in the instruction in the establishment of the optional course in Microscopy, this was effected largely through the efforts of the Alumni Association. Mr. A. P. Brown a graduate of the College and a practical microscopist was elected director. In 1883, Professor Power resigned his position as director of the Chemical laboratory, to accept the chairs of Pharmacy and Materia Medica in the University of Wisconsin, and the Chemical laboratory was placed in charge of Professor Sadtler, Professor Trimble being elected to assist in the direction.

The year following (1884) a practical examination in analytical chemistry for candidates for graduation was instituted, and the preliminary junior examinations just established, brings this brief history

of the changes and improvements within the last 24 years up to the present time. The last important advance is the establishment of the preliminary junior examinations; this plan received the sanction of the Board of Trustees in the early part of this year (1884) and is now on trial. It was entered into after a thorough and careful review of the methods employed in the various technical and literary institutions of learning in this country. The mode of conducting ordinary preliminary examinations, as practiced by many colleges, was not believed to be suited to the needs of a College of Pharmacy, the requisite qualifications of a good pharmacist, embrace not only good intellectual acquirements and a sound elementary education, but a peculiar adaptation for the duties of the profession of his choice. A graduate of Yale, Harvard or Cornell, would probably make as good a practical pharmacist as a graduate of a first-class academy, but he is hardly likely to be any better—whilst an enthusiastic energetic plodder after the truths of physical and chemical science, who is blessed with a good brain, an observing eye, quick perceptions, a retentive memory and a steady hand, even if his early advantages have been limited to a good common school education has as good a chance in time to become eminent in his profession as his more fortunate colleague.

The amount of knowledge possessed by a student is not a measure of his practical worth in the world, *but the amount of knowledge that he can successfully apply*, is. The great evil of our present systems of education particularly with many of the higher order, is, that young men are not taught “how to do *their own* thinking;” lines of thought are laid down for them, rules and rigid theoretical methods are to be committed to memory, and if a case occurs out of the regular routine which calls for a practical application of the very principles that they have been studying so long, they are completely at a loss and wander hopelessly. This unfortunate oversight in education has been the means of bringing the graduates of some of our best literary colleges into disgrace, in the eyes of practical men (particularly journalists), who continually and often unjustly sneer in the public prints at the available worth of these sorry victims of a defective system. The Faculty of the Philadelphia College of Pharmacy have always recognized the value of a practical application of knowledge, and this writer willingly bears testimony to the habit which is always exercised by the examiners of giving a candidate a higher mark for the answer to a question which is correctly rendered in the applicant’s own language than if the exact

words of the text-book were used *verbatim et literatim*. Questions are framed which compel the student to use his own words and do his own thinking, and he is thus trained for subsequent examinations to expect such questions, and this is a direct incentive to original thought. At every step in a process he is trained to ask himself the question: why is this? This method of instruction led to the establishment of a plan for auxiliary instruction, which has been one of the most valuable advances that this College ever instituted; *i. e.*, the appointment of competent assistants to the professors to act as quiz masters; these gentlemen meet the classes immediately after the lectures and systematically ask the members of the class, questions upon the subjects of the lectures delivered by the professors, and the great value of hearing the facts of a subject repeated in a different way, from different lips a week after the lecture was delivered, and following the necessary individual study of the subject, fixes the facts upon the mind of the student, ambitious to obtain knowledge, in a way which will be of lasting value to him in after life.

Every effort is made to break up the pernicious system of "cramming for examination" and it is impossible for a student to obtain a good record, who is a mere memorizing machine; the subjects must be comprehended in order to win the coveted prizes. As it is of the utmost importance to the student, and to the best interests of the College for the applicant to know just exactly what is expected of him in the outset of his collegiate course, it was deemed far better to take a longer time than is usually given to preliminary examinations, and in order to thoroughly and properly test the student's fitness to become a pharmacist, he is first given the opportunity of listening to two months lectures; during this time he becomes acquainted with the distinctive method of instruction adopted by the Faculty, and is then subjected to an examination. This "*preliminary junior examination*" is so conducted that the scholarship of the student is ascertained at the same time that his ability to master the subjects that he is expected to grasp is. His arithmetic, orthography, grammar, powers of composition and expression, penmanship, etc., exhibited in the answers to his questions and grouped under the heading "*scholarship*," determines the candidate's fitness to pursue his studies, if he has shown a deficiency in scholarship he is not permitted to take the next examination, but must make up his deficiencies and be re-examined at some future time, at least a year afterwards.

The principal advantages of this method over the ordinary preliminary examinations lie in the fact that the College is furnished with better students, and the student is more *justly* treated, he is not given an examination on subjects which have no connection whatever with the particular branch of science that he has elected to study; *but his fitness to study Pharmacy is proved by an actual practical trial of his ability to master the elementary portions of the pharmaceutical subjects that are taught in the College.* If his ability is proven and he passes the examination successfully, his labor does not go for naught, but the record that he makes has a bearing in determining his fitness to enter the advanced or senior class. In this way the advantages of the progressive system of teaching Pharmacy are realized, and the student has the opportunity of ascertaining, in the outset of his career, whether his chances of becoming a good Pharmacist are cheering enough to warrant the further expenditure of time, labor and money or not. An examination in the ordinary English branches of education *alone* can never give him this knowledge, for he might pass an examination in these perfectly, and yet fail absolutely in a pharmaceutical examination.

PRELIMINARY EXAMINATION.

BY ANDREW BLAIR.

This subject has been receiving much attention of late, and is one that deserves more than has been given to it. The popular demand of the day is "Elevate the Standard of Education," especially in the various branches of science. This certainly is very proper, and in fact, necessary in such an age of progress as we are now enjoying. The methods employed to reach the attainment of this may, in some cases, be the most suitable and efficient, while in others more or less defective. These remarks will offer a few hints that may or may not be an improvement on present usages, in either case to provoke some discussion on the subject which shall result in a genuine and substantial elevation of the standard of education of the Pharmacist.

What should a Pharmacist be? While it is proper and essential to prosperity and substantial success that a man in any and every calling should be honest, industrious, possessed of good morals, faithful and true in his representations and practice, it is eminently so with the Pharmacist, and he should be a man intelligent and qualified in the details of his calling, not necessarily reaching deep down into the long

range of scientific research. He should have a stock of general information, gathered by observation as well as from practice, experiment and print in its various forms, much of which may not bear directly on his calling, but the possession of which may often assist him in applying ideas and working out methods or processes that may be valuable to him.

Why does he become a Pharmacist?

Ask the young men in any of the classes of our schools of pharmacy and most likely every one will answer "To earn a living." This is certainly a very commendable motive, and if the party shows a fitness for it he should be encouraged by all proper means. Schools of Pharmacy are established in various parts of this country as well as Europe to educate young men in the different branches of the sciences required. As a rule these are in the habit of accepting all applicants who are willing to purchase the necessary tickets. No question is asked as to the fitness or capacity of any applicant to receive and be benefited by the instruction to be given him. If he has not any preliminary ideas or knowledge of the subjects or substances to be discoursed upon, how can he receive, retain and digest the matter to the extent it is proper and necessary he should. Here is where and when the preliminary examination should be required. Many of the young men who attend these schools have had no practical or preliminary training whatever. They attend the lectures, purchase and surround themselves with every book of reference offered, and if they have retentive memories pass a successful Junior examination, and the succeeding winter repeat the dose, with the difference that it is a degree higher, and the parchment is secured. It may be claimed there are practical departments attached to these schools; what of that? Two or three hours a week, for four or five months of a winter season, to be a substitute for the constant drilling (as in olden times) of the pestle and mortar, by the hour, or the grinding of roots and drugs by the half-day. Place a young man at a prescription counter after such a course of studies and what is his *practical* worth? An answer is hardly necessary, as many employers who will read this have had experience and can answer it for themselves.

At once we are confronted with the assertion that all who desire to learn have not and cannot obtain the practical experience of a proper kind, and it may be so. Is this any reason that such should be crammed theoretically only, and on the day of graduation placed side

by side with those thoroughly drilled in the rudiments and practice of the profession, and proclaimed before the world as equally competent and qualified to follow their chosen calling the one with the other? As has been remarked, the chief object of the education, is to "make a living." It is the practical side of the question which certainly carries the most weight.

Again it is declared that no young man is allowed to graduate till he has had a certain practical experience with some qualified apothecary. Are the character and quality of these certificates ever examined into? Is the question asked if the party giving the certificate of experience is a qualified pharmacist, or a dry goods merchant, with a few bottles in one corner of his store; or a general country storekeeper with about the same complement of drug store requisites as the dry goods man. Some may say it is impossible to learn such facts. Not so, when we have State organizations in almost every State in the Union, the officers and members of which are reputable Pharmacists.

What is the general result?

The country is supplied with Pharmacists—good, bad, and worse.

The institution, whose certificates of proficiency they hold, is extolled or degraded as they (the holders of them) show to the world their real worth based on the training or education received.

In other words, this grinding out of young men as graduates is a mistake in more ways than one, and always the community and frequently the graduates are the losers by it.

What is the remedy? No, we will not call it that, but ask can any system or method be suggested to improve this condition of things?

What are the objects of the schools of Pharmacy?

Is it to create a class of men, morally, practically and scientifically fitted to assume the responsibilities of and conduct a profession that holds the lives of the community within their grasp, who are to be trusted for their integrity and ability to supply such things as are honest and proper, intended to heal the wounds of the suffering and cure the disease that is wasting life away; or is it to turn out as "many" as possible, regardless of such or like considerations? If the first sort or class are to be the character of those educated, then sort out the material from which they are to be made. How? When young men apply for their tickets for a Junior course, require them to pass a preliminary examination in the rudiments of the branches they are to study (the result of their two or more years' experience with a quali-

fied Pharmacist), in addition to the evidence of a good school training, which must also be accompanied with a certificate that the applicant has been employed for two full years with a qualified Pharmacist, and has shown a fitness for and application to his calling that warrants his entering on a course of studies to perfect himself in his profession. The standing of the author of said certificate to be ascertained from the State society where he holds forth, in case he is not known to the College authorities where the application is made.

Arrange a course of study which shall result in a thorough and practical knowledge of the rudiments and scientific details of the profession without compelling an acquirement of extreme scientific investigation which will be of little practical advantage to those who wish to follow pharmacy as a means of livelihood. If some wish to follow the scientific, let them have the opportunities of special instruction, but do not oblige every student to follow it in order to gain his diploma as one competent to select drugs, compound properly the same and dispense them in proper shape and quality to answer the purpose for which they are intended.

FURTHER CONTRIBUTIONS TO THE ANALYSIS OF MALT EXTRACT.

BY J. F. CARL JUNGK, Fremont, Ohio.

The analytical methods recommended by me in the paper communicated to the June number, 1883, of this Journal, have been largely used in the examination of malt extract in Europe, as well as in the United States, and some have criticised the method of determining diastase as not being precise enough. My object in publishing the method of examination of malt extract at that time was principally to show those inexperienced in analytical work a way for determining, in an easy manner, the presence of diastase. This I believe has been at least partly accomplished, as in a number of commercial malt preparations in which diastase could not be detected before it has been subsequently found, although not in such proportion as might be expected. The following treatise is somewhat more detailed, but intended more for those who are acquainted with the various analytical manipulations. Familiar methods of determination will, therefore, only be referred to.

A malt extract prepared with sufficient care will always transform the same amount of starch in the same time as the malt which has been used for its preparation. For the purpose of comparison of the diastatic effect of a good malt extract we must first determine the diastatic effect of a good malt.

Commercial malt varies greatly in quality. If we take into consideration only well-looking malt we shall find that, although its appearance allows the inference of its being of the best quality, it nevertheless varies greatly in its diastatic effect. Malt is met with which will transform its own weight of starch in 2 minutes at 100°F., and 5 times its weight in 7 minutes at 150°F., while other malt, at 100°F. will require 7 to 10, or even 25 minutes for the conversion of its own weight of starch, and at 150°F. for the transformation of 5 times the weight of starch will need 27 to 120 minutes. Now, if a malt extract be met with which will change its own weight of starch in 2 minutes at 100°F., or 5 times its weight in 7 minutes at 150°F., it is to be regarded as an excellent preparation.

The manufacturer cannot always secure malt effective in 2 and 7 minutes, as indicated, and, therefore, in simple justice, the time should be fixed at 5 and 18 minutes respectively; that is, a malt extract which will change its own weight of starch in 5 minutes at 100°F. or 5 times its weight of starch in 18 minutes at 150°F. should be regarded as good. This requirement is not too severe, and therefore all extracts which do not come up to this standard should be rejected as poor preparations.

Examination of the Malt.—For this purpose I use 1 part of malt, ground fine, to every 5 parts of starch, which has previously been boiled to a paste with 125 parts of water, and determine the time which is necessary, at a temperature of 150°F., to change the starch; that is, until the liquid ceases to acquire a red color upon the addition of iodine. A good malt, and a properly prepared malt extract, will require for this change from 7 to 18 minutes. Using the malt as a fine powder, or previously extracting it, will make no difference in the time requisite for the transformation.

A malt which will transform 5 parts of starch in 7 minutes at 150°F. requires for 10 parts of starch 20 minutes at 150°F.; for 20 parts of starch 70 minutes at 150°F.; for 1 part of starch 2 minutes at 100°F.

Now, if we accept these figures as a basis, we can easily express in figures the value of a malt extract with respect to the diastase.

Malt Extract; Determination of Diastase.—Among many technical analyses I have performed 248 analyses of malt extract. The extract was prepared by me, using 120 bushels of malt, 34 lbs. to the bushel, in each case, the malt being previously examined as to its diastatic value. The figures given further on represent the average of these 248 analyses.

The method frequently followed of allowing the malt extract to act from 12 to 24 hours on a large amount of starch should be rejected, because the changes occurring hereby are not always caused by the diastase; for instance, the generation of acid, which increases steadily, takes part in the transformation of the starch; further, the decomposition of the nitrogenous bodies, which interfere with the action of the diastase, or may altogether destroy it. It is certain that this change takes place quicker in the human stomach:

1. Because the transformation of the starch is in part effected previously by the baking and boiling of our food.

2. The transformation products are speedily absorbed in so great a measure that thereby the diastatic effect is accelerated.

3. In the process of digestion acids are produced, which support the action of the diastase until the amount becomes too great, after which the diastase is destroyed, and the acids act only on the nitrogenous bodies.

The diastase acts on starch paste very quickly, and the time required, therefore, is only to be reckoned by minutes. Such action should continue no longer than 1 hour, because a watery solution of malt extract begins to decompose after 1 hour. A solution changing the starch paste in 5 minutes will after 6 to 10 hours require 12 to 15 minutes. These are the principal reasons why I use smaller amounts of starch, and set down as standard the time required for transformation.

In order to prove the action of the diastase in the stomach, as indicated above under No. 2, recourse may be had to the dialisator, with which the following experiment was made.

One part malt extract was mixed with 100 parts by weight of starch which had previously been boiled to a paste with 2,500 parts of water. One-half of this mixture was placed in a dialisator, the other half in a closed bottle. Both portions were placed in water, and exposed to a temperature of 150°F. for 24 hours, the water into

which the dialisator was placed renewing itself constantly. After 24 hours the solution in the dialisator still had a fresh odor, showed little acid, and scarcely gave with a solution of iodine a red color, while the solution in the bottle had assumed a very unpleasant smell, tasted very sour, and still contained a large amount of undecomposed starch, which, on an addition of 2 parts, by weight, of extract, did not dissolve.

Two extracts of equal amounts of diastase may contain unequal amounts of acids, and then act differently on starch, as has been proven by the tables given in my previous paper. For this reason the amount of acid should always be determined before examining the diastatic effect, and should, in a carefully prepared extract, and calculated as lactic acid, never exceed 1.085 per cent. for every 100 parts of dry substance.

If the amount of acid is larger, the acid should first be neutralized, and following this the effect of the diastase should be examined.

A neutralized malt extract will certainly not act as rapidly on starch as an acid extract will. For instance, a malt which is not neutralized will act on an equal weight of starch in 2 and 5 minutes, respectively, at 100°F.; after the acid is neutralized it will dissolve the same amount of starch in the same time, but at a temperature of 150°F.

Considering that commercial starch is not always of the same quality, more precise examinations require for use a filtered solution of starch paste, in which the amount of starch has been determined. After unfiltered starch has been wholly transformed into gum and dextrin, its membranes are attacked and require a long time for dissolving. Therefore it often occurs that after iodine shows no coloring a violet color may again be produced after the lapse of a few minutes. These reactions will pass off smoothly by using the filtered starch solution.

For neutralizing the acid I mix well-washed and still moist carbonate of magnesium with a 10 per cent. solution of malt extract, shake until the acid reaction has disappeared, filter, and add the requisite quantity of starch paste. This method should always be resorted to as a check experiment for the determination of diastase. For ascertaining the effect of diastase on large quantities of starch we should always use the dialisator.

Remarks on the Testing with Iodine.—Respecting the addition of the solution of iodine to the water, with which the reaction upon starch is

to be accomplished, it should be continued merely until the color of the liquid appears faintly yellow. In this manner, only, can the changes of color be distinctly watched. Before adding the fluid to be tested, 5 drops of a 10 per cent. sulphuric acid should be added for every 2 oz. of water, in order to arrest the further effects of the diastase, and to combine with the bases or organic decomposition products possibly present. In this manner the experiment may be made with any kind of water.

Should the changes of color still be indistinct, which, with a malt extract poor in diastase, is always the case, the tested liquid should be warmed till it appears colorless. On cooling the blue color appears first, followed by the red, and lastly the brown color, the latter, when much albumen was contained in the malt extract.

Using a large quantity of starch for these examinations, the warming of the tested liquid is absolutely necessary, as the large amount of dextrin produced will hide the color reactions. If we wish to omit the iodine reaction, determinations of the sugar, dextrin and gum must be made, which will be described further on. In this place it may be sufficient to say, that 100 parts of starch are equal to 105.8 maltose or 111.6 grape sugar.

Extracts of different diastatic value requiring for the transformation of an equal weight of starch 2 minutes at 100°F., require for 5 parts of starch 7 minutes at 150°F.; 4 minutes at 100°F., require for 5 parts of starch 10 minutes at 150°F.; 5 minutes at 100°F., require for 5 parts of starch 18 minutes at 150°F.; 7 minutes at 100°F., require for 5 parts of starch 27 minutes at 150°F.

One part of the same malt extract requires the following time for dissolving different amounts of starch at 100°F. and 150°F:

1 part starch	2 minutes	at 100°F.;	$\frac{1}{2}$ minute	at 150°F.
2 parts	5	"	3 $\frac{1}{2}$ minutes	"
5 "	45	"	18	"
10 "	95	"	60	"
50 "	12 hours	"	120	"
(still violet.)			(still violet.)	

One part of another extract neutralized required at 150°F., for 1 part of starch 4 minutes; for 2 parts of starch 10 minutes; for 5 parts of starch 60 minutes.

Ash Determination.—To determine the several constituents it is best to use a solution containing 10 grams of malt extract in every 100cc.

This solution should never be allowed to stand longer than 6 or 8 hours, and during this time should be kept at a cool place. Further, every time the solution is measured or weighed it should be well shaken.

On the incineration of malt extract, a charcoal very difficult to consume, is produced, and it is therefore best to incinerate only small quantities; for example, 5cc. of the 10 per cent. solution. Complete combustion may be attained by frequently cooling the crucible, dampening the charcoal with alcohol or spirit of nitrous ether and allowing the temperature never to exceed a dark red heat. If a combustion-furnace is at hand, the incineration with oxygen is to be preferred to any other method.

The determining of the several constituents of the ash may be omitted here; but I would remark, that the amount of phosphoric acid is one-third, and that of potassa is 30 to 32 per cent. of the whole ash.

Estimation of the Solids and of the Water.—If, instead of using the tables published in my former article, gravimetric determinations are to be made, I would like to call attention to the following:

Evaporation of the extract by the usual method is not easily accomplished, as notwithstanding all care, the extract will be partly burnt near the edge of the crucible, while the main bulk is yet damp. To avoid this change it is necessary to mix the extract with dry, clean sand and expose it in a glass tube placed in the drying-oven to a current of dry air or carbonic acid gas. In this manner exact results are quickly attained. Should the extract of commerce contain glycerin, it is necessary to call attention to the fact that glycerin may lose 12 per cent. of its weight on heating at 110°C. for 6 hours.

Estimation of the Nitrogenous Substances.—In estimating these substances, combustion with soda-lime should always be resorted to. Or the total albumen, etc., may be precipitated with tannin solution. The precipitate is then washed, dried, weighed, and after a deduction of 8.75 per cent. for tannin, is counted as nitrogenous substance.

Another part of the solution of malt is boiled, and after cooling, the coagulated albumen is collected, washed, weighed, and deducted from the total albumen. In this manner we get the amount of, by heat, soluble and insoluble albuminous bodies. In both estimations the ash should also be determined and its amount deducted.

Attention should also be directed to the necessity of precipitating

with tannin, always in the cold, because, if the solutions are warm, the resulting precipitate cannot be filtered off.

The coagulable, and while boiling, non-coagulable nitrogenous substances are the most important estimations.

For the separation of all the nitrogenous bodies I recommend W. Klinkenberg's method, published in "Repert. d. Analyt. Chemie," II, 376, and "Fresenius Zeitschrift," vol. 22, page 621. I have made a number of assays according to this method and received good results.

A malt which is rich in diastase contains in 100 parts of nitrogenous substances:

peptone.....	74.79
albumin.....	47.14
protein.....	8.07
or, coagulable substance.....	37.70
non-coagulable substance.....	62.30

With respect to the peptone, the greatest variation occurs, and depends on the greater or smaller diastatic action, and it seems also to be much influenced by the temperature and time used in the preparing of the malt extract.

Determination of the Gum.—It should be remarked at the outset, that a malt extract, rich in diastase, never contains a trace of dextrin, but a gum which is left rotating, and therefore does not deserve the name dextrin; it is precipitated by acetate and by basic acetate of lead, as well as by alcohol, does not reduce copper solution in the cold, but on heating, reduces it only very slowly; with a mixture of calcium chloride and ammonia a precipitate is produced. It is easily transformed into right rotating sugar, by hydrochloric or sulphuric acid, and a portion of it is also, in a dilute solution, by diastase, converted into dextro-sugar, which shows the presence of two gums.

If malt extract be allowed to act on a large amount of starch, as in the production of maltose, then little gum and a large quantity of dextrin is produced. Having made a full examination of this gum, I shall report my results in a subsequent paper.

For the determination of this gum, the albuminous bodies are precipitated with a 10 per cent. tannin solution; the filtrate is then mixed with an equal volume, or a sufficient quantity of a 30 per cent. acetate of lead solution, and the precipitate is washed first with water, and later on with alcohol. If polarization is intended, the precipitate may be decomposed by sulphate of sodium, and the clear filtrate brought

directly into the apparatus. Using a tube of 200 millimeters, each degree to the left indicates 0.998 per cent. of gum. If the gum is to be determined in a different way, the lead precipitate should be decomposed, in the usual manner, by H_2S , the gum be transformed into grape-sugar by the use of acid, and the sugar be determined with copper solution. Or, the solution freed from lead, is again precipitated with basic acetate of lead, filtered, the residue dried, weighed and burned, and then the oxide of lead deducted.

Determination of the Maltose.—The filtrate from the precipitate with lead acetate may be directly polarized; for a tube of 200 millimeters each degree to the right indicates maltose equal to 0.364 per cent. of the solution. Or sufficient sulphuric acid is added to the filtrate, until the free acid amounts to 2 per cent., and heat is applied for six hours, when the maltose will be converted into glucose, the latter being determined by Fehling's solution, 10Ccm. of which indicate 0.07 Gm. of maltose.

From 248 analyses the mean composition of 2 to 4 minutes malt extract, calculated for 100 parts of dry substance, has been determined as follows:

Maltose.....	69.270
Gum.....	23.800
Soluble albumen.....	3.826
Insoluble albumen.....	1.405
Lactic acid.....	1.085
Ash.....	1.614
	<hr/> 100.000

Sirop de Dentition (Delabarre).—Among my notes I find the following improvement, credited to Hager (?):

Glycerini.....	℥i
Chloroformi.....	gtts. x
Tinct. croci hispan. (1:8).....	℥ss
Mellis.....	℥ss
M.	

This formula is more likely to relieve the itching of the gums than the original. Spanish saffron, by the way, is credited with possessing amodyne (calming) properties.

The best way to exhibit the syrup would be to apply it to the gums by smearing, and slightly rubbing them.

HANS M. WILDER.

[Hager, in "Phar. Praxis," i, p. 957, gives the following formula: Tinct. croci 7.5, Tinct. ipecacuanhæ 1.0, Syr. rhei 50.0, Syr. liquiritiæ 50.0 gm. Some add a little vanilla. (See, also, "Am. Jour. Phar.," December, 1884, p. 614.)—EDITOR AM. JOUR. PHAR.]

A CHEMICAL EXAMINATION OF POLYGONUM HYDROPIPER.

BY HENRY TRIMBLE AND HERMAN J. SCHUCHARD.

[A contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.]

From recent reports of the medicinal activity of this drug and from the absence of a complete analysis of it, we were induced to undertake an examination with a view, primarily, of determining the nature of the pungent principle. The drug was collected for us in the vicinity of Philadelphia, during the past summer, by a botanist thoroughly familiar with the requirements of the case, so there can be no doubt about the species of *Polygonum* employed in the following analysis.

About 50 grams of the tops and leaves, free from the larger stems, were powdered and the whole passed through a No. 80 sieve; of this 20 grams were taken, and the scheme recommended in Dragendorff's Plant Analysis followed as closely as the peculiarities of the case would admit.

Petroleum spirit, with a boiling point below 45°C., extracted 2.7 per cent. of a material which proved to be a wax, melting at 48°C., soluble in absolute alcohol, ether and chloroform, and saponifying with alcoholic potash. No volatile or fixed oils were found.

The drug, after extraction with petroleum spirit, was dried and exhausted with absolute ether, which extracted 1.54 per cent., a very small portion of which was soluble in water, the remainder was soluble in chloroform, benzol and absolute alcohol; a concentrated solution in the last solvent, when poured into water caused a turbidity due to resin; from these and some other tests, we were led to believe that the ether-soluble portion consisted of resin and chlorophyll.

The original drug after the ether treatment was dried and exhausted with absolute alcohol, by which we obtained 5.14 per cent. of solid matter. 2.27 per cent. of this was soluble in water; this aqueous solution contained tannin. When made alkaline and treated successively with petroleum spirit, benzol and chloroform, then acidified and similarly treated, no crystalline principle was obtained. The portion of the alcoholic extract insoluble in water proved to be an acid resin. The alcoholic solution contained the pungent principle, but on heating it disappeared.

The remainder of the original drug yielded to water 7.22 per cent.

of solid matter. No crystalline principle was found, but there was obtained .55 per cent. of gum and 1.44 per cent. of sugar. That portion of the drug insoluble in water yielded 5.95 per cent. of solid matter to a .2 per cent. solution of potassium hydrate, which was made up to 1 per cent. of albuminoids and some phlobaphene. That which remained from the treatment with dilute alkali gave to hydrochloric acid 6 per cent. of solid matter which consisted principally of the salts found in the ash. Only a very small amount of starch was found. On bleaching the final residue with chlorine water, drying and weighing, 57.45 per cent. of cellulose was obtained. Another portion of the original drug yielded 10.25 per cent. of moisture, and on incineration, 7.4 per cent. of ash of which 3 per cent. was soluble in water, consisting of potassium and sodium salts; the remainder proved to be iron, aluminium and calcium with phosphoric acid.

Two tannin determinations, by the gelatin and alum process, gave very close to 3.46 per cent. A tincture of the drug was made with diluted alcohol, which contained the pungent principle, but on concentrating by distillation that peculiar taste failed to show itself, either in the concentrated residue or in the distillate. The residue on treatment with petroleum spirit, benzol and chloroform, yielded nothing. From these experiments we concluded that the active principle is decomposed on the slightest heating, and that the only proper preparation of the drug would be one made without the application of heat.

In AMERICAN JOURNAL OF PHARMACY for November, 1871, Dr. C. J. Rademaker claims to have isolated the active principle, which he named polygonic acid. We prepared some of this substance according to his method, by exhausting the drug with diluted alcohol, evaporating and adding basic acetate of lead, by which we obtained the yellow precipitate. This, on treatment with H_2S , yielded to the first portions of ether shaken with it a greenish, and to the successive portions a brownish residue. All these portions were acid to litmus paper and gave the reactions stated by the author. We also found this residue to give a precipitate with gelatin, and in many other ways to resemble tannic as well as gallic acid; the latter would account for the crystalline appearance of the residue. As such treatment of the drug would probably give tannic and gallic acids, we tried a mixture of the two by the same reagents as were applied to the so-called polygonic acid, and found a remarkable similarity. The conclusion naturally follows that polygonic acid is a mixture of impure tannic and gallic acids,

together with a small quantity of chlorophyll. The following summary shows the amount of the most important constituents :

	Percent.	
Water.....	10.25	
Wax.....	2.70	From petroleum spirit solution.
Resin and chlorophyll	1.54	From ether solution.
Resin, tannin and chlorophyll	5.14	From alcoholic solution.
Sugar.....	1.44	} From aqueous solution.
Gum.....	.55	
Tannin and extractive.....	5.23	
Albuminoids.....	1.00	} From alkali solution.
Phlobaphene, etc.....	5.95	
Salts and a small amount of extractive.....	6.00	} From dilute acid solution.
Cellulose.....	57.45	
	<hr/> 97.25	

Separately determined : tannin, 3.46 per cent. ; ash, 7.40 per cent.

PHILADELPHIA, *December 16, 1884.*

Nutmegs are Poisonous.—Early in December, 1884, one afternoon, a lady here ate one and a half nutmegs. About two hours after, she became drowsy, and remained so nearly an hour, the drowsiness amounting almost to stupor. This was followed by an excited condition, with sharp pain in the brain, then involuntary laughter, wild fancies and incessant talking, without loss of consciousness. Presently pain was felt in the region of the heart, with cold extremities and a depressing sensation. Her face was very pale and her pulse weak and thready. These alarming symptoms lasted more than an hour, during which time two doses of ammonium bromide were administered. Next morning it was necessary to repeat the dose. Since then she has been unusually nervous.

I publish this case because it is not generally known that nutmeg is poisonous ; and, being regarded as a valuable domestic remedy, it is well to remember that large doses of it are dangerous. This patient took about 135 grs., whereas from 5 to 20 grs. is the dose.

J. DABNEY PALMER, M. A., M. D.

MONTICELLO, FLA.

[The narcotic properties of large doses of nutmeg are mentioned in Natl. Dispensatory, p. 1007, and in U. S. Dispensatory, p. 969.—EDITOR.]

PRACTICAL NOTES FROM FOREIGN JOURNALS.

BY HANS M. WILDER.

Cake White (Face Powder).—Oxide of zinc 4, rice starch 4, white French chalk 4, calcined plaster of Paris 1; rub well together, and mix with sufficient water to suitable consistence so that it can be poured out into boxes or paper moulds (if in moulds, cut to proper size and shape after 5 to 10 minutes).—*Pharm. Zeit. Russl.*, xxii, p. 6.

Oils of Cassia and Cinnamon may be distinguished by their specific gravity. The former has 1.0366, and the latter 1.0097.—*Rundschau*, viii, p. 768.

Carbon Diffuses through Porcelain.—Violle has observed that if a porcelain crucible, inserted into a black lead crucible, be heated to about 1,500°C. (melting-point of palladium), the latter will look as light colored as if made of clay, while the porcelain crucible is quite black.—*Ber. d. Deutsch. Ges.*, xv, p. 275.

Paper and leather may be rendered very pliable by soaking in a solution of 1 part of acetate of sodium or potassium in 4 to 10 parts of water, and drying.—*Polyt. Notizbl.*, xxxvii, p. 365.

Citric Acid Freed of Iron.—During the Turco-Russian war some 40,000 pounds of citric acid got contaminated with iron and zinc.

Meyke found that, by converting the acid, by means of chlorinated lime, into citrate of calcium, and decomposing the latter with sulphuric acid, he succeeded in obtaining a perfectly pure acid. To a cold filtered solution of 16 parts contaminated acid in 96 parts distilled water was added about 21 parts chlorinated lime, previously reduced to a thin paste. After quickly straining, the liquid was heated to boiling, separating completely the citrate of calcium, while the chloride of iron and zinc remained in solution. The magma was transferred to a strainer, and washed completely with boiling hot water till ammonium sulphhydrate ceased to indicate metals. To the citrate of calcium (about 20 parts) was added about 60 parts of diluted sulphuric acid (1:5), under constant stirring, and, lastly, heating to boiling.

After complete decomposition the solution of pure citric acid was filtered from sulphate of calcium, evaporated to syrupy consistence, let stand for some hours, decanted from the sediment, and evaporated further in water-bath. Crystallization was hastened by dropping a small crystal of citric acid into the cooled liquid. Meyke obtained from

52 pounds impure citric acid 40 pounds pure acid by means of $68\frac{1}{4}$ pounds chlorinated lime and $32\frac{1}{2}$ pounds concentrated sulphuric acid. $35\frac{3}{4}$ pounds calcined gypsum were obtained as a by-product.

He found the following methods unsatisfactory: 1. Oft repeated recrystallization. 2. Carbonate of calcium. 3. Carbonate of barium. 4. Acetate of lead. 5. Wood and animal charcoal.—*Pharm. Zeit. Russl.*, xxii, p. 297.

Musk.—The German Consul-General in Shanghai states that the average annual exportation is about 3,000 catties (one catty contains 15 to 20 pods of Yunnan musk, or 20 to 25 pods of Tonquin musk); this requires 60,000 musk deer. He states further that even the best pods do not contain much more than 60 per cent. of true musk, and 30 per cent. will about represent the average.—*Schweiz. Woch.*, xxi, p. 157.

Bestucheff's Tincture of Iron.—100 parts of solution of chloride of iron, 400 parts of absolute alcohol, 150 parts of sulphuric ether.—*Rundschau*, ix, p. 301.

Carbolic Acid.—According to Meyke the red color is due to the presence of lead; he recommends to keep it in tin containers.—*Pharm. Zeit. Russl.*, xxii, p. 431.

Brandy Flavor.—4 parts of acetic ether, 50 parts of Jamaica rum, 100 parts of arac, 1,000 parts of alcohol and 1,200 parts of water; pour over 10 parts of pineapples and let stand.—*Rundschau*, viii, p. 503.

Meat Juice.—Sippel recommends the following as the easiest way to obtain nearly all the juice:

Cut one pound of best lean beef in slices about one-third of an inch thick, and lay the slices one alongside of the other on a strip of muslin, 6 inches wide and 1 yard long, sprinkling with fine salt. Now roll up the whole strip, tie a string several times around, and put in an ordinary press. After half an hour, about half a pint of red, transparent juice will be obtained.—*Pharm. Zeit. Russl.*, xxii, p. 600.

Varnish for Sheet-iron and Tin Ware.—30 parts of crystallized acetate of copper (verdigris) is rubbed to a fine powder, and, spread in a thin layer, left exposed in a moderately warm place for several days. The light-brown powder is ground with a little oil of turpentine and mixed with 100 parts of fat copal varnish, previously heated to 120°F. Let stand several days in a warm place, shaking it once in a while; finally, let deposit. If applied in three or four coats, a

dark-green color is produced ; if only one or two coats, and afterwards heating in a drying oven, different colors are obtained, according to the longer or shorter exposure to heat (light or dark gold, orange, brownish red).—*Polyt. Notizbl.*, xxxviii, p. 172.

Precipitation.—The best way to precipitate is not to pour one solution into the other, but to pour both simultaneously, in a thin stream, into a large quantity of water.

The precipitates obtained in this way are not only in an exceedingly fine state, but also easy to wash out and dissolve.

If the two solutions differ much in specific gravity, the best way is to let the heavier run in near the top of the water, and the lighter near the bottom. If possible, both solutions ought to be brought to the same bulk.—*Dieterich, Pharm. Zeit. Russl.*, xxiii, p. 371.

Honey.—Dieterich finds that honey kept in woods very soon ferments, while honey from the same batch kept well in glass or earthenware.—*Pharm. Zeit. Russl.*, xxiii, p. 385.

Fixed Oils, Fats and Ointments.—Dieterich strongly recommends benzoinating them ; he employs at least 10 per cent. benzoin, although for fats 20 per cent. is better. Only recently rendered fat can be preserved successfully in this way (and all ointments made with it) ; old and partially rancid fats are not preserved.—*Ibid.*, xxiii, p. 386.

Bicarbonate of Sodium.—Dieterich recommends keeping the bicarbonate in a cool place and in tightly stoppered containers, since it is apt to lose part of its carbonic acid, and thus be converted into mon carbonate if exposed to the air.—*Ibid.*, p. 387.

Saponimentum.—This is a name proposed by Dieterich for opodeldoc, and he gives several formulas. Saponimentum with arnica ; Peru balsam ; carbolic acid ; eucalyptus ; iodine ; iodine and sulphur ; iodoform ; tar ; sulphur ; storax ; thymol.

They consist of stearin soap, olein soap, alcohol and the respective medicinal component.—*Ibid.*, p. 389.

Silver-plating Solution.—Ebermeyer dissolves 20 parts of silver in 60 parts of nitric acid, adds 20 parts of caustic potassa, 50 parts of distilled water, filters, and adds sufficient distilled water to 22° B. (sp. gr. 1.176). The objects are cleaned with alkali, etc., dried, warmed, and moved backward and forward in the solution ; they are then dried with saw-dust, and finished with precipitated chalk and chamois.—*Pharm. Zeit. Russl.*, xxiii, p. 405.

Cement for Brass on Glass (for instance, petroleum lamps).—1 part

of caustic soda, 3 parts of rosin and 5 parts of water are boiled together till solution is effected, which is intimately mixed with one-half of its weight of plaster of Paris. The mixture hardens within one hour, and is impermeable for coal oil.—*Puscher, Pharm. Zeit. Russl.*, xxiii, p. 423.

Moth Paper.—Soak paper with equal parts of carbolic acid and naphthalin.—*Dieterich, Ibid.*, p. 486.

Green Color for Ointments and Oils.—Sicha recommends an alcoholic extract of turmeric (one part representing ten parts of the root), which is rubbed smooth with a little alcohol, and mixed with the liquefied fat. When about half cooled down add sufficient of a solution of blue carmine (indigo carmine) till the desired shade has been obtained.—*Leitm. Rundschau*, ix, 2.

Creasote.—A more manageable form for toothache than the pure article is creasotated collodium (equal volumes creasote and collodium), which forms a kind of varnish over the carious tooth.—*Ibid.*, p. 6.

Pain Paint.—Against migraine, toothache, etc. 5 grams oil of peppermint, 10 grams chloroform, 6 grams acetic ether, 10 drops essential oil of mustard, 5 drops oil of valerian. Use a camel's hair brush.—*Ibid.*, p. 28.

Itch Remedy.—Wash the whole body, on going to bed, with a solution of hyposulphite of sodium (1:5), and the next morning with diluted muriatic acid (1:20). By this treatment the pores of the skin will contain finely divided sulphur.—*Leitmeritz*, x, p. 757.

Production of Sulphate of Quinine in Europe.—Fabricca lombarda, Milano, 200 kilos a day; Boehringer & Sons, Mannheim, 150 kilos; Zimmer, Sachsenhausen, 100 kilos; Pelletier, Paris, 100 kilos; Howard, London, 50 kilos; Brunswick, 50 kilos; Jobst, Stuttgart, 20 kilos; Koch, Oppenheim, 20 kilos; Amsterdam, 10 kilos; Frankfurt on the Main, 10 to 20 kilos; Whiffen, London, 10 to 20 kilos; Tellandier, Paris, 10 kilos.—*Leitmeritz*, x, p. 456.

Purity of Copaiva Balsam demonstrated microscopically.—Place a drop of the balsam on a slide, and dust in a few grains of canna starch. If pure, the starch granules will be invisible; if the balsam, however, be adulterated, its altered refractive power will cause the starch to become visible.—*Ibid.*, x, p. 598.

German Oil of Rose.—The well-known essential oil firm, Schimmel & Co., in Leipzig, have undertaken to distil the oil from roses grown in Germany, and at their first venture obtained three kilos of oil. Its

odor is stronger than that of the Turkish oil (chiefly, perhaps, because it is pure), and its freezing point higher. Turkish oil freezes at 21°C., while the German freezes already at 32°C.—*Ibid.*, x, p. 676.

SUBSTANCES ACCOMPANYING BENZOIC ACID PREPARED FROM BENZOIN.

BY O. JACOBSEN.

On treating benzoic acid from gum benzoin with sodium carbonate solution, an oil is left undissolved, smelling of vanillin and also of phenol. By fractionation, it may be separated into three principal portions, boiling at 200–210°, 235–245°, and 280–330°, and a pitch-like residue not further examined. The first fraction consists of methyl benzoate and guaiacol, which can be separated by treatment with cold dilute caustic soda. The second and smaller fraction, when shaken with water, gives up catechol in the aqueous solution; the portion insoluble in water and dilute alkalis is acetylguaiacol. The third and largest portion consists of an oil, insoluble in dilute alkalis, which by saponification with alcoholic potash, and subsequent treatment with water and ether, yields benzyl alcohol, and benzophenone, whilst the aqueous solution contains guaiacol and benzoic acid; this fraction therefore contains benzyl benzoate, benzophenone, and benzoylguaiacol. The oil also contains vanillin, but in minute quantity only. The medicinal value of sublimed benzoic acid is attributed to the catechol and guaiacol; it is believed that of the above bodies only vanillin and benzyl benzoate exist ready formed in the gum. Benzaldehyde may be formed by the oxidation of the contained benzyl benzoate, so that the production of the former cannot be considered as a proof of adulteration with cinnamic acid. Schlickum and Schneider have tested the genuine nature of natural benzoic acid by its reducing boiling ammoniacal silver solution; but catechol will reduce the solution in the cold, and the author therefore suggests the following method of testing:—Convert the benzoic acid into the sodium salt, and, after drying, shake with ether; after removal of the ether, the residue may be dissolved in water, and the above or any other tests for catechol applied.—*Arch. Pharm.* [3], xxii, pp. 366–374; *Jour. Chem. Soc.*, Nov. 1884, p. 1168.

QUASSIN AND ITS CONSTITUTION.

BY V. OLIVERI and A. DENARO.

In order to prepare quassin from quassia, 10 kilos. of the finely divided wood are twice extracted with 45 litres of boiling water, and the solution evaporated to 10 litres *at a gentle heat*; when cold, the quassin is precipitated by tannin, collected, washed, and after being mixed with a sufficient quantity of lead carbonate, it is thoroughly dried at 100° . The product is then extracted with boiling alcohol, the alcohol distilled off, and the residue set aside until it deposits the quassin in a crystalline state; it is, however, always contaminated with resinous matters, from which it is purified by repeated crystallisations from dilute alcohol: 30 kilos. of the wood gave 10 grams of pure quassin. It crystallises in very slender, colourless, iridescent needles, which belong to the monoclinic system, the predominating form being the oblique prism with rhombic base. It melts at $210\text{--}211^{\circ}$ (Christensen 205°), and is very soluble in alcohol, chloroform, and acetic acid, but only sparingly in ether: 100 parts of water at 22° dissolve 0.2529; the aqueous solution becomes yellow on exposure to the air, is dextro-rotatory, excessively bitter, and reduces Fehling's solution. The results of the analyses agree nearly with the numbers required by the formula $C_{32}H_{44}O_{10}$, and differ considerably from those given by Wiggers and by Christensen, who proposed the formulæ $C_{10}H_{12}O_5$ and $C_{31}H_{42}O_9$ respectively.

When quassin is heated at 90° for some hours with dilute sulphuric acid (4 per cent.), it yields *quasside* $C_{32}H_{42}O_9$, a white, amorphous, bitter substance, formed from quassin by the removal of the elements of 1 mol. H_2O ; no glucose could be detected in the mother liquors. It melts at $192\text{--}194^{\circ}$, and when boiled with dilute alcohol is reconverted into quassin, which crystallises out as the solution cools. Quasside is also formed when quassin is boiled with acetic anhydride, but if sodium acetate is present there is a powerful reaction, and several substances seem to be produced; these have not as yet been submitted to examination.

Bromine diluted with acetic acid acts on a solution of quassin in the same solvent, and on adding water an amorphous resinous substance is obtained, but it does not crystallise; this melts with decomposition at 155° , and the results of the analyses suggest the formula $C_{32}H_{41}Br_3O_9$. Nitric acid added to an acetic solution of quassin seems

to give rise to a nitro derivative, which is precipitated on the addition of water. It dissolves in boiling alcohol, and, as the solution cools, is deposited again as a yellowish powder which melts at 130° .

If quassin is heated with concentrated hydrochloric acid in sealed tubes for four hours at 100° , methyl chloride is formed and escapes on opening the tubes; whilst the hydrochloric solution when diluted with water, deposits first a resinous matter, which should be removed and then, after a time, a colorless substance in small nodules. This new compound, which the author calls *quassic acid*, $C_{14}H_{19}O_3 \cdot COOH$, or $C_{28}H_{38}O_6(COOH)_2$, is far less soluble in alcohol than quassin, and crystallises in silky needles which melt at 245° , and reduce Fehling's solution and ammoniacal silver nitrate in the cold. It seems to be formed thus: $C_{32}H_{44}O_{10} + 2HCl = C_{28}H_{38}O_6(COOH)_2 + 2CH_3Cl$, so that quassin would be the ethereal salt of quassic acid. The author has also tried the action of nascent hydrogen, and of boiling dilute nitric acid on quassin, but the products are resinous. Fusion with potash and oxidation with chromic anhydride also gave unsatisfactory results.

The resinous matter obtained in the preparation of crystallised quassin, and in all probability produced from the latter, was submitted to distillation with zinc-dust. The brown oily product was treated with sodium and fractionally distilled; the portion passing over at $170-190^{\circ}$ when again distilled gave an oil boiling at $173-178^{\circ}$ of the formula $C_{11}H_{16}$, whilst crystals melting at $76-78^{\circ}$ were obtained from the residue in the retort.—*Jour. Chem. Soc.*, 1884, p. 1192, *Gazetta* xiv., 1-9. See also *Amer. Jour. Phar.*, 1884, p. 98.

Use of Iodoform.—Unna recommends iodoform for the healing of soft chancres, and for obviating the occurrence of suppurating buboes. The sore is first dried with absorbent cotton, then a drop of solution of iodoform in ether is spread upon the sore, and when it has become dry, it is covered with a piece of iodoform plaster or muslin. To conceal the smell the whole is covered with cotton, perfumed with an alcoholic solution of coumarin or other aromatic spirit. For the preparation of *Pencils of Iodoform*, Unna recommends iodoform 10 Gm., acacia 3 Gm., tragacanth and glycerin each 1 Gm.; sufficient water being used to form a mass, which is made into 5 pencils.—*Monatschr. f. Dermatol.*, Aug., 1884.

COCAINE AND ITS SALTS.¹

BY E. MERCK.

Cocaine, $C_{17}H_{24}NO_4$ (according to Lossen), is the alkaloid contained in coca leaves (*Erythroxylon Coca*, Lam.), which was first isolated by Niemann in 1860. In 1862, Lossen discovered in the same leaves a second principle, hygrin, which is of a volatile nature, and has been hitherto but little investigated, but it appears to have a weak and hardly characteristic action. The further component parts of the coca leaves appear to be eeginin, coca-tannin, and a peculiar wax.

The cocaine crystals belong to the monocline system, melt at $98^{\circ}C.$, are easily soluble in alcohol, even more easily soluble in ether, but only dissolve in 704 parts water. The salts of cocaine are, on the other hand, readily soluble in water. The salts prepared commercially are the hydrochlorate, salicylate, hydrobromate, tartrate and citrate.

The first reports as to the results of the internal use of coca leaves have been handed down from the sixteenth century (Dr. Mondedes, Seville, 1569). In 1749 the plant appears to have been first brought to Europe. It was described by Jussieu and was named *Erythroxylon Coca* by Lamarck.

Tschudi, Markham, Poppig, and others, who have traveled in South America, found that the natives were in the habit of chewing coca leaves as a remedy for, or preventive against, the effects of extraordinary physical exertions.

The Indians chewed the leaves in conjunction with the ashes of *Chenopodium Quinoa*, the alkali contained in which seems to have eliminated the tannin from the coca leaves, and to have left the alkaloid free.

Since the discovery of cocaine the belief has gained ground, and, as it appears, quite correctly, that this alkaloid is the really active principle of coca leaves. At first it was believed, apparently with good grounds, that it possessed a property analogous to that possessed by caffeine, theine, and theobromine, viz., the power of retarding or stopping the change of tissue, but hitherto no facts absolutely confirming this theory have been discovered. Administered in small doses cocaine has an exhilarating effect, but in larger doses it paralyses the nerve centres and other parts of the nervous system. It has a fatal

¹ Abstract from a paper communicated by the author.

effect on warm-blooded animals (which are, however, apparently less affected by it than are cold-blooded creatures), by causing a cessation of respiration; it would therefore appear that cocaine is a poison, though its toxic qualities appear to be very mild and its action not cumulative.

Schroff, who made the first experiments with cocaine in 1862, observed that doses of 0.05 gram administered internally to rabbits caused considerable variation of the pulse and in the breathing, as also temporary mydriasis; the same dose administered subcutaneously caused death in convulsions of an epileptic nature, mydriasis in a strong degree being also observable, which, however, disappeared at once after death. In the case of frogs a dose of 0.001 gram produced complete immovability (preceded by a prior appearance of excitement); a dose of 0.002 gram proved fatal to frogs.

According to Frommüller, who made experiments in 1863, with a view of testing the narcotic effects of cocaine, a dose of 0.03–0.33 gram, internally administered, seemed to have no important effect upon human beings; in some cases sleep resulted, pulse and breathing at first somewhat accelerated, but afterwards became slower than under normal conditions.

In a case of attempted suicide a dose of 1.5 gram seemed to have no seriously injurious effect; the fatal dose, therefore, for human beings would appear to be very considerable.

As far as experiments with the infusion of coca leaves have hitherto gone they would appear to show that the coca leaves contain from 0.02 to 0.2 per cent. of cocaine; 0.05 gram of cocaine hydrochlorate seems to be the suitable dose for human beings.

The effects of subcutaneous injection of a solution of cocaine, on human beings appear to be, first, a feeling of warmth, then insensibility to feeling in the neighborhood of the part in which the injection has taken place, and, finally, a reddening of the skin. After a lapse of thirty minutes matters appear to resume their normal condition.

Cocaine placed on the tongue seems in some cases to deaden the action of the nerves. Dr. Th. Aschenbrandt states that he has found cocaine to have an excellent effect upon the human frame exhausted by diarrhoea. During the last few months Professor E. V. Fleischl, of Vienna, has affirmed that cocaine in the form of a subcutaneous injection is undoubtedly a valuable adjunct in preventing and curing the

craving for morphia. This circumstance alone should be sufficient to ensure for cocaine a lasting position as a valuable article of medicine.

In cases where the treatment can be prolonged decreasing doses of morphia and increasing doses of cocaine, and in cases where rapid treatment has been decided upon doses of 0.1 gram of cocaine alone are subcutaneously injected as often as the craving for morphia becomes apparent. Dr. Frend, who, amongst other instances, completely cured a case of craving for morphia within ten days by means of doses of 0.1 gram of cocaine subcutaneously injected three times daily, is of opinion that morphia and cocaine act antagonistically to each other.

The treatment of dysomania seems to be comparatively much more troublesome; the first attempts appear to have been made in America and to have resulted fairly favorably. Cocaine has also been recommended as an aphrodisiac, and Dr. Frend seems to have certainly observed symptoms of sexual excitement after its administration.

As already observed, cocaine brought into immediate contact with the mucous membrane seems to produce temporary insensibility to feeling, and trials have been made with it not only in cases of disease of the throat, windpipe, etc., but results have also been obtained in the direction of producing local anæsthesia for the purpose of operations on the mouth, throat, etc. Cocaine will also probably come into important and frequent use in cases of ophthalmia.

On September 15 of this year, at the meeting of ophthalmologists at Heidelberg, the experiments made by Dr. Koller, in Vienna, were fully discussed. This gentleman experimented on various occasions on the eyes of animals and also upon his own eyes, and found that immediately after the introduction, by dropping, of a 2 per cent. solution of cocaine hydrochlorate a burning sensation in the eye lasting for about half a minute resulted, which was followed by an indefinite sense of dryness, the opening between the lids of the eyes under treatment appeared to be wider, while the tendency to shrink back, which would otherwise manifest itself on the cornea being touched, for instance, a twitching back of the head or of the eyelids, or the tendency of the eye to draw back on being touched, seemed to disappear, so that in this condition it was possible to produce by pressure a dimple on the cornea, or even to lay hold of the conjunctiva bulbi with tweezers without producing any unpleasant sensation. This absence of feeling on the part of the eye continued for about ten minutes, but a certain lack of

its usual sensibility continued for several hours. Twenty to thirty minutes after the introduction of the solution of cocaine hydrochlorate the pupil became enlarged, returning after some hours (at longest apparently after twelve hours) to its normal condition.

A slight difficulty in accommodating the two eyes to each other, which could, however, be easily overcome by an effort, was the only abnormal symptom observed during this period; otherwise the functions of the eye remained intact.

Which of the cocaine salts is preferable for the purposes of eye surgery remains to be proved, and will probably be positively ascertained very shortly. It remains to observe that the experiments, the results of which have been detailed in the foregoing were without exception made with the cocaine hydrochlorate; but it seems beyond doubt that the effects of other cocaine salts agree with the observations made in the case of cocaine hydrochlorate.

Dr. von Hoffmann, of Baden-Baden, an ophthalmologist, recommends cocaine salicylate for ophthalmic purposes.

Cocaine citrate has been successfully used by dentists for the purpose of anæsthisising the dental nerves. This salt can be readily formed by kneading into pills, which, after being wrapped in wadding and moistened, are placed in the hollow tooth, which can then be cleaned or extracted comparatively, or even totally, without pain.

Cocaine splits up with concentrated hydrochloric acid into eegonine, benzoic acid and methyl alcohol. Experiments are now being made as to the physiological action of eegonine.—*Phar. Jour. and Trans.*, November 29, 1884, p. 426.

Administration of Quinine by the Rectum.—Dr. R. Peek states that quinine may be easily administered to children in the form of suppositories, and that the drug is not only rapidly and promptly absorbed in this way, but that also far larger doses may be given than per os. He made use of from 16 to 24 grains of the muriate of quinine at a single dose, adding about 30 grains of butter of cacao and a small quantity of simple cerate as mass for the suppository.—*Deutsche Med. Wochenschrift*, 1884.

CRYSTALLISED COLCHICINE.

BY A. HOUDÈS.

Three kilos. of colchicum seeds were exhausted with 100 kilos. of alcohol of 96°, the liquid filtered, the alcohol distilled off, and the residue treated repeatedly with a 5 per cent. solution of tartaric acid, which dissolves out the colchicine, but leaves fatty and resinous matters undissolved. The filtered solution was then agitated with chloroform, the chloroform removed by evaporation, and the crude product purified by repeated crystallization from a mixture of equal parts of chloroform, alcohol, and benzene. The yield from the seeds is about 3 grams per kilo., whilst that from the bulbs is only 0.4 gram per kilo.

The colchicine thus obtained forms nodular groups of colorless prisms, slightly soluble in water, glycerol, and ether, but soluble in all proportions in alcohol, benzene, and chloroform. It has a very bitter taste, and an alkaline reaction, contains nitrogen, and burns without residue. It is hydrated, and melts at 93°, but after drying at 100°, the melting point rises to 163°. A solution of colchicine does not reduce an alkaline copper solution, but after prolonged boiling with dilute sulphuric acid, it reduces it immediately, and in this respect resembles solanine. Colchicine combines with certain organic acids, but is decomposed when brought in contact with strong acids.

Concentrated or dilute inorganic acids dissolve colchicine and form a citron-yellow solution; nitric acid produces a transient violet coloration. Solutions of colchicine are precipitated by potash and soda, but not by ammonia. Tannin produces a white precipitate soluble on heating; platinum tetrachloride, an orange-yellow precipitate; an aqueous solution of iodine, a kermes-red precipitate; mercuric potassium iodide, a yellow precipitate; iodine in potassium iodide, a maroon-yellow precipitate.

Colchicine exerts a physiological effect only in relatively large doses. Respiration and the functions of the heart are considerably modified, and the general effect is a state of collapse, with stupor, but without insensibility.—*Compt. rend.*, xcvi, pp. 1442–1444; *Jour. Chem. Soc.*, pp. 1055–1056, October, 1884.

PERSIAN OPIUM.¹

BY CONSUL-GENERAL BENJAMIN, OF TEHERAN.

Some years ago the production of opium in Persia was larger than at present. The unusual proportion of morphia which Persian opium contains made it justly preferable to that produced elsewhere, and large quantities found their way to foreign markets, and especially to China.

Two causes have latterly tended to check the culture and export of Persian opium, although the trade in the article is still important. One of these causes alone might not have led to such a result, but the two coming about the same time have somewhat discouraged the production of Persian opium. These causes were, the increasing adulteration of the article and the fact that the attention given to its culture materially reduced the more important culture of wheat, which led the Government to regard the opium product with disfavor.

Persian opium is chiefly grown in the provinces of Kermanshâh and Ispahân. The latter city is the centre of the opium trade of Persia. The opium of Ispahân is the best; the highest grade has been found to contain 15 to 16 per cent. of morphia. It is fair to state, however, that of late the opiums of Kûm, Teherân and Yezd have been growing in favor, some specialists considering the quality raised at Kûm as surpassing every other grade of opium. As the highest quality of Smyrna opium does not contain a mean of over 13.57 per cent. of morphia, some analyses placing it even lower, while the Persian drug yields at its best 13 to 16 per cent. of morphia, hard, it certainly rivals that of Smyrna, and is beyond question far superior to that of Egypt and India.

The chief objection to the opium of Persia lies in the adulteration to which it is subjected, the chief ingredient in this deterioration being grape-must, and sometimes small stones concealed in the parcels. This difficulty could be remedied by any enterprising house which, through honest, capable agents, could purchase the entire product of Persia, or of any one of the opium producing districts, and give direct attention to the preparation and packing of the drug. A pure article could also be obtained by a firm ready to form a contract for a certain quantity of a given grade of the drug for a term of years, the continuance of

¹ From the *Independent Journal*.

the contract depending on the non-varying proportion of morphia in the exported article.

The average price of the opium of Persia, in its crude state, is now four dollars and seventy-seven cents per kilogram. To 72 kilograms of opium are added 6 kilograms of linseed oil. The mixture is then subjected to a manipulation which reduces the 77 to 66 kilograms. These 66 kilograms are divided into one hundred balls, forming a Persian package. A specified number of the balls of opium make a case. The cost of packing, freight, and other incidental expenses bring the average price of a case of Persian opium, such as is prepared for export, up to three hundred and sixty-six dollars and sixty-six cents. The excise duties vary at different centres of the trade, but 5 per cent. *ad valorem* is the uniform rate according to the treaty of Turkomontchai on all goods exported to Europe or America, and, I may add, on all goods imported from those countries into Persia.

It is stated that two thousand cases of opium, valued at 732,000 dollars, are now exported from Bushire to England, besides what finds its way to China and other quarters from the other districts of Persia. There is no doubt that if sufficient encouragement were offered, especially by the establishment of agencies at Ispahân or Teherân, or by making permanent contracts, the product could be easily increased and the purity of the exported article improved. Indeed the opium merchants of Ispahân have already made overtures for the American trade, and are prepared to make contracts for a term of years.

It is proper to state inquiries made of practising physicians at Teherân, including an American physician, elicit the highest opinions in favor of the opium of Persia as regards the character and quantity of morphia it produces when unadulterated.—*Phar. Jour. and Trans.*, November 29, 1884, p. 430.

Tooth Paste.—Dr. A. W. Harlan of Chicago, recommends the following: Take of Precip. chalk, powdered orris root, aa ʒij, white castile soap, powdered borax, aa ʒss, powdered myrrh, ʒii, honey and glycerin, q. s. to make a soft paste. Color rose pink. Perfume to suit. To be used before retiring and after breakfast, on a brush not dipped in water and not too stiff.—*Dental Cosmos*, September, 1884.

CULTIVATION OF CINCHONA IN BOLIVIA.¹

BY MINISTER GIBBS, OF LA PAZ.

I have devoted some time and attention to acquire data and information relative to the next important article, cinchona bark, or quina, of which large quantities are exported yearly. Formerly it was gathered by the Indians, and in such a manner that large forests were destroyed, trees cut down, the bark taken in any way merely to make up large quantities; to-day the quina plantations, or, as they are called here, quinales, are cultivated and nourished with care and agricultural science, the principal planters being Germans, one, Mr. Otto Richter, possessing two million plants; the estate of Mr. John Kraft, a Hollander, lately deceased, two million.

The cultivation of quina in plantations, systematically, has been carried on for about seven years, hardly long enough to show all the advantages, as there is room for much study and improvement.

Mapire, about sixty leagues north of this place, or about five days' journey, has under cultivation about four million five hundred thousand plants; Longa, northeast of this city about twenty leagues, five hundred thousand plants; Yungas, east northeast twenty leagues, one million plants; Guanay, east of Mapire, five hundred thousand plants; total, six million five hundred thousand plants.

Where the principal quinales are it is a very rough and broken country, the Andes being seamed and cut into deep valleys in every direction. The trees are planted on the sides of the valleys or ridges in altitudes of about 3,000 to 4,000 feet above the sea. They will grow higher up, even to 8,000 feet, but are stunted, and will give little or nothing of what is called here the quina salt. The plants want a great deal of sun, heavy rains and fresh winds.

I have conversed with three of the principal superintendents of the large quina plantations, all Germans, and they say that the cultivation of quina is yet in its infancy, and there will be many improvements through time and experience.

A tree will give from fifteen to twenty pounds of seed. The seed is collected in November and December (the early summer months here), and planted very thickly in boxes or beds about twelve feet in length and three feet in breadth, and placed on a slight decline or fall

¹ From the *Independent Journal*.

and well irrigated. When the plants are about six inches in height and have a few leaves—from five to six (which is about five months)—they are transplanted; holes of some eight to ten inches deep are dug about six feet apart, in which they are planted. The plant is covered partly over with twigs and other light stuff, grass and leaves, to keep off the sun for about three months. When the plant is strong and healthy, the undergrowth of other plants is cleaned out and great care is taken. This attention continues for about two years, and then the plants that are left are considered sound. About 25 per cent. of all the plants decay or rot in this time. Afterwards the undergrowth is cleared out once a year, and when the tree is six years old it is productive, grows to about fourteen feet in height, and has a diameter of about six inches, up to six or seven feet. Where the bark is of the most productive kind, the trunk grows straight and slender, and has the form of an orange tree. When a tree is left standing for ten or twelve years, it is over a foot in diameter, the bark is thicker and heavier, but not so productive in quinia. The bark is ready to cut when the tree is about six years old. An incision is made around the trunk of the tree a few inches from the ground, another incision some twenty-four inches above around the tree, and then two incisions opposite, lengthwise. The bark is pulled off in two pieces. Two cuts, and sometimes three, are got off each tree, twenty-two to twenty-four inches in length, and seven to eight inches in width. When removed it curls up like the cinnamon bark. After the tree is stripped it is cut down, leaving a trunk about twelve inches above the ground, and from the base, where the bark has been left, there spring out some fifteen or twenty shoots or sprouts; these are left growing until they are a little higher than the stump, then they are thinned out, leaving two or three; they grow fast and in five years give good bark.

The trees produce on an average about four and a half pounds of bark, and are stripped, in the southern hemisphere, late in the spring, October to January. The bark is placed in paved yards, and is generally cured in four days, but if rain sets in, at times it takes nearly three weeks.

The principal enemy in the insect line is a large black ant, which is very destructive. There are various classes of the quina tree, calysaya, green and purple. The greater part of the quina passes through this city baled and sent to Tacne and Mollendo. *Cinchona* is the common name for all quina.

The market price is now forty cents per pound, Bolivian currency. It has sold as high as two hundred bolivianos per quintal. It formerly paid a tax of 6.40 bolivianos per quintal; now one half, 3.20 bolivianos, one half to the Government and one half municipal.

As the greater part of the quina forests were destroyed, and until very lately, the cultivation of quina has not been carried out in a proper manner, it is only now that it may be said to be a regular business. The highest exportation of late years has been twenty thousand quintals; but it has dwindled down for various causes, so that this year it will not be more than five thousand quintals, and at present prices leaves no profit, the expenses of getting it to the coast being heavy.—*Phar. Jour. and Trans.*

THE HARVESTING OF CINCHONA BARK.¹

The old idea that for the collection of the bark it was necessary to sacrifice or fell the whole tree, when grown to maturity, had long made way for a better view. In English India, Broughton had begun, in 1866, to pollard the trees, in order to be able to lop the new shoots after four to five years (coppicing system) as is done in Europe with oak and ash coppice. But, besides the trees receiving a serious shock by this treatment, from which they do not so speedily recover, the bark thus obtained is not nearly so good as the stem bark.

It was, therefore, an ingenious idea of Mr. McIvor, in the Neilgherries, to cover the stems with moss, in order to improve the quality of the bark. He was led to this by observing that the best—the so-called crown-cinchona—always occurs covered with moss. He made experiments in this direction and the result was that, not only was the quality of the bark improved, but that in this way it was possible to strip the stem of a part of the bark and to heal the wound thus made by covering it with moss, in other words, to renew the bark by artificial means.

By experiments on a large scale the new discovery was crowned with the best success.

The “mossing system” is almost universally practised in Java since 1879, and numerous chemical analyses have shown that the proportion of quinine in the renewed bark increases, and is even trebled. The “coppicing system” is now only practised when a rapid production of

¹ From the *Indian Mercury*. Reprinted from the *Tropical Agriculturist*.

bark is required, or when the sort does not allow of the "mossing system;" the felling, or rather uprooting, of the tree, is still practised exceptionally, when it withers, or when the plantation requires thinning.

Lastly, by way of trial, another method has been followed for a short time, viz., scraping off the outer bark; but though this product offered a precious and valuable material for the quinine manufacturer, the "scraping system" has not been continued on account of culture and commercial considerations. If I do not mistake, the *Ledgeriana* (in chips) realized at the sales in Amsterdam, in 1879, the enormous price of 10.44 f. per $\frac{1}{2}$ kilogram. The quinine proportion was 13 per cent.

The "coppicing system" in a modified form, by leaving one shoot on the stem, is now generally and successfully practised in Java with the *C. Ledgeriana*.

The harvest of cinchona bark deserves a moment's further attention, as so little is known about it. Do not expect a description like "Les Vendanges" in Provence or Languedoc, or a mill-feast in a sugar-works in East Java, or of the padi-cutting in Java described by Multatuli. The reaping of the cinchona bark is unattended by poetical accessories, and the work-people are all quiet. In those elevated regions, sparsely populated, and then only temporarily, no clamor whatever prevails. All nature bears an appearance of monotony and gloominess. In the gardens and woods the sun can hardly penetrate; the trees mostly dripping with rain, or from the clouds floating above, it breaks down in a dreadful thunderstorm. Then the laborers—among whom are not unfrequently mothers with infants at the breast—experience all the miseries of a mountain climate at an elevation of 7,000 feet. Shivering with cold, the women sit, sheltered as much as possible by a screen of plaited dried leaves, peeling the lopped branches, and cutting the wet bark to measure; the small slivers, or so-called refuse, is carefully collected in baskets.

The heavier work is performed by men; they lop the branches, or, if the "mossing system" be followed, they make incisions lengthwise in the stem, at intervals of 3 to 5 or more centimetres, according to the thickness of the tree, and then strip the stem from below upwards to where the branches begin, but in such a manner that strips of bark of equal breadth are left alternately on the stem, by which it assumes somewhat the appearance of a fluted column. The strips of bark are then cut into lengths of 50 centimetres, and the stem, which is partially

denuded lengthwise, is entirely enveloped, as is done in Europe to some trees that could not bear exposure to our winters. McIvor at Madras did this first with moss, and hence the name "mossing;" but as this material was soon exhausted in Java, recourse was had to alang-alang, indjoek or dried grass, which occurs in great abundance.

In the course of one year this envelope is removed, then the healing—granulation we should say—the renewing of the bark is begun, and now comes the turn of the strips left on the tree the preceding year to be stripped off. Then the stem is again bandaged.

The wet bark, after being cut to measure, is dried either in the sun, or artificially, by which the pieces roll up in their breadth and thus form the familiar pipes. The packing is generally in jute-bags. They weigh about 75 kilograms.

From chemical investigation it has been proved that drying in the sun or by artificial heat is the same for the bark, and has no influence on the proportion of quinine.—*Phar. Jour. and Trans.*, Nov. 22, 1884, p. 410.

GALLISIN, THE UNFERMENTABLE PART OF COMMERCIAL GLUCOSE.

BY C. SCHMITT AND A. COBENZL.

Neubauer and other authors have stated that in wine, which in its preparation has been subjected to Gall's treatment with glucose and fermented, a certain portion of the glucose remains in the wine as an unfermented substance which is neither glucose nor dextrin. Owing to the interest that has arisen as to the possible unwholesomeness of gallinated wines, the authors have been led to investigate the subject, and have succeeded in separating from fermented glucose (prepared from potato-starch) an intensely hygroscopic substance which they have named *gallisin*. A physiological investigation of this compound is in progress, but at present for purposes of priority, the purely chemical part of the research is published.

Preparation of Gallisin.—A solution of 5 kilos. of glucose was fermented at 18–20° for five or six days with yeast and filtered. The solution thus obtained was then evaporated to a thick syrup on the water-bath and shaken in a flask with a large excess of absolute alcohol; it became thicker, but did not mix with the alcohol. After a second treatment with absolute alcohol (by means of which water, sugar, organic acids, etc., are extracted) the syrup was found to be converted into a

crumbling yellow-gray mass, which by pounding in a mortar with a mixture of absolute alcohol and ether can be obtained as a gray powder. This powder may be purified by dissolving it in water, repeating the above treatment, and drying over sulphuric acid.

Gallisin when viewed under the microscope is found to be amorphous and without any characteristic structure. It is intensely hygroscopic, more so than calcium chloride, but yields no definite compound with water. It is insoluble in ether, chloroform, and benzene, very sparingly soluble in glacial acetic acid and in absolute alcohol, but slightly more so in methyl alcohol, and in this it differs from glucose which is readily soluble. It dissolves when boiled in a mixture of glacial acetic acid and absolute alcohol, but it is precipitated from this solution by ether. In concentrated aqueous solution, it has an acid reaction to litmus-paper; and undergoes no change, either by heat or when treated with lead acetate, mercuric nitrate or chloride, ferric chloride, tincture of iodine, or calcium or barium chloride. Barium hydroxide precipitates a small quantity of a white barium compound. With silver nitrate, it undergoes no change until it is heated or ammonia is added, when metallic silver is precipitated. It rapidly reduces potassium permanganate, especially in slightly alkaline solution, with separation of peroxide of manganese. Potassium dichromate in dilute acid solution is also rapidly reduced. Fehling's and Knapp's solutions are reduced by it (in this it differs from dextrin), and 0.05 g. glucose are equal to 0.109784 g. gallisin in reducing power. A concentrated solution of gallisin prevents the precipitation of iron salts by ammonia or caustic alkalis. With acetic anhydride, it gives an acetyl compound, and it is converted into glucose by treatment with dilute mineral acids on the water-bath. On treating an aqueous solution with fresh yeast it is not fermented, nor does it undergo lactic fermentation, but if a dilute aqueous solution is allowed to stand for a time it decomposes with formation of a mouldy fungus. At 100° it gives off water and carbonic anhydride. It has a slightly sweet taste at first, but in time becomes insipid. A solution of gallisin turns the plane of polarization to the right, and this power increases according to the dilution of the solution. A very pure white specimen, when analysed with every care to prevent access of moisture, was found to contain 43.50 per cent. C and 7.36 per cent. H, and these results lead to the formula $C_{12}H_{24}O_{10}$ (C, 43.9; H, 7.32).

Gallisin-barium, $C_{12}H_{22}BaO_{10} + 3H_2O$, may be obtained by precipi-

tating a concentrated aqueous solution of gallisin by barium hydroxide in alcoholic solution, and is purified by dissolving the precipitate in water, reprecipitating with alcohol, and washing with ether. The pure substance readily absorbs carbonic anhydride, is slightly alkaline, and reduces Fehling's and Knapp's solutions. It loses its water of combination over sulphuric acid.

Hexacetylgallisin is formed by heating gallisin with acetic anhydride for two and a half hours at 130–140° under pressure. The resulting brown mass is soluble in alcohol, and after driving off the excess of acetic anhydride on the water-bath, may be purified by boiling with charcoal; the acetyl-derivative is obtained on evaporation of its alcoholic solution as a colorless glass-like mass of the formula $C_{12}H_{18}O_{10}\overline{Ac}_6$. It is insoluble in water, but soluble in alcohol and similar solvents. If gallisin be heated for several hours at 170–180° with an excess of acetic anhydride, it is decomposed with formation, amongst other products, of ethyl acetate.

Gallisin-potassium, $C_{12}H_{23}KO_{10}$, is precipitated from an alcoholic solution of hexacetylgallisin by boiling it with alcoholic potash, ethyl acetate being formed simultaneously. It is a hygroscopic powder soluble in water, with alkaline reaction. In a similar way a precipitate of gallisin-lead may be obtained, $C_{12}H_{22}PbO_{10} + PbO$.

Conversion of Gallisin into Grape-sugar.—Equal parts by weight of gallisin and oxalic acid were heated on the oil-bath at 103° for two to three hours. On separating the oxalic acid with lime and evaporating the solution, a thick sweet syrup was obtained which in a few days formed a crystalline mass of glucose. The whole of the gallisin, however, could not be converted into glucose; by the prolonged action of oxalic acid on an aqueous solution of gallisin, it becomes yellow, and smells strongly of caramel.

Oxidation of Gallisin.—On pouring a solution of 100 grams gallisin in 50 cc. water into 400 grams strong nitric acid, a powerful reaction takes place, and the solution becomes heated to boiling, with evolution of nitrous fumes. On cooling, neutralizing with potash, and afterwards strongly acidifying with acetic acid, an acid potassium salt crystallizes out in beautiful groups of white needles soluble in hot water but sparingly in cold. About 20 grams of these were obtained and the results of analysis agreed with the formula $C_6H_9KO_8$. From this acid salt a neutral silver salt, $C_6H_8Ag_2O_8$, was prepared, and from the lead salt by the action of sulphuretted hydrogen the free acid was obtained

as a thick, acid, uncrystallizable syrup, soluble in water and alcohol but insoluble in ether. On distilling the ammonium salt, besides ammonia, pyrroline, etc., a sublimate was obtained which is soluble in water, alcohol, and ether, and at present is under investigation.

Action of Heat on Gallisin.—On heating gallisin in a current of hydrogen gas on the water-bath at 65° , carbonic anhydride and water are given off, and at 100° it melts to a thick amber-colored syrup; 17.2 per cent. of water (4 mols. = 18 per cent.) and 13.7 per cent. of carbonic anhydride (1 mol. = 13.4 per cent.) were given off. This syrup has many of the properties of gallisin, as has also its barium compound, which is found on analysis of the barium derivative to have the formula $(C_{11}H_{23}O_8)_2Ba$. This may mean that gallisin, when heated, gives up water and carbonic anhydride, but when the resulting substance is treated with water the water is again taken up, and, as the barium derivative shows, a compound is formed containing 1 mol. of carbonic anhydride less than gallisin.

The authors succeeded also in preparing pure gallisin from a wine which had been prepared by Gall's process in 1873, and identified it by the above reactions and by analysis. In conclusion, the authors mention that a physiological investigation of gallisin is being made, and already it has been found by numerous trials that there is no direct or indirect unwholesomeness in the use of gallisin or of the glucose which is formed along with it.—*Ber.*, xvii., pp. 1000–1015; *Jour. Chem. Soc.*, pp. 981, 982 and 983, October, 1884.

COLLOIDAL DERIVATIVES OF FERRIC HYDROXIDE.

BY E. GRIMAUX.

When potassium hydroxide is added to a mixture of glycerol and ferric chloride, a precipitate is formed soluble in excess, and the solution has the characteristic properties of the colloidal solutions previously described (coagulation, etc.). The tendency to coagulate is diminished by the presence of a large amount of glycerol, and increased by the presence of sodium chloride or of potash in excess. If the proportion of glycerol is very large, coagulation is entirely prevented. When solutions rich in glycerol are dialysed, they first lose their excess of potash, then their excess of glycerol, and become coagulable by heat, and finally they form a firm thick jelly containing glycerol, ferric

hydroxide, and potash. Similar solutions are obtained by substituting either ammonia or soda, or sodium or potassium carbonate for potash. They seem to be compounds of glycerol, ferric hydroxide, and alkalis, and are easily dissociated by water into glycerol and insoluble compounds richer in ferric hydroxide. With acetic acid, they yield a precipitate soluble in excess, and this solution gives a greenish precipitate with potassium ferrocyanide, converted into Prussian blue by the action of a mineral acid.

Mannitol, erythrol, and sugar yield solutions having precisely similar properties.

Ferropotassium tartrate also forms colloidal solutions with similar properties, but they are not precipitated by potash in the cold, and the precipitate with carbonic anhydride is ochreous, and resembles ferric hydroxide. Potassium ferrocyanide produces a violet coloration, and Prussian blue is precipitated from this solution on adding an acid.

When a solution of ferric chloride is added to a solution of sodium arsenate, a precipitate of ferric arsenate is formed, but redissolves in excess of ferric chloride, forming a colloidal solution, which yields an opaque yellowish-white coagulum of the composition $\text{Fe}_2(\text{AsO}_4)_2$. In preparing this solution, excess of ferric chloride must be avoided, since this substance prevents coagulation by heat. If the solution is dialysed, it loses sodium chloride, and the jelly which forms is perfectly transparent and of a pale yellow color, but by prolonged dialysis it becomes reddish-yellow.

Potassium arsenite and ferric chloride yield a similar solution, which is very unstable, and coagulates spontaneously. With potash, it forms a precipitate soluble in excess, and when this solution is dialysed it yields a colloidal solution of ferropotassium arsenite, which does not gelatinise on heating unless mixed with potash solution; when a thick brown jelly resembling ferropotassium tartrate is formed. Arsenious acid therefore resembles tartaric acid in its behavior with ferric salts.

Boric acid and sodium phosphate behave like arsenic acid, but in the case of the phosphate the solution shows less tendency to coagulate.

A 2.26 per cent. solution of silica, obtained by the decomposition of methyl silicate, forms with ferric chloride and excess of potash a limpid solution, which becomes turbid after a few minutes.—*Compt. rend.*, xeviii., pp. 1485–1488 and 1540–1542; *Jour. Chem. Soc.*, p. 966, October, 1884.

THE PRESENCE OF OXIDES OF MERCURY IN BLUE PILL AND IN OTHER MERCURIAL PREPARATIONS.¹

BY HAROLD SENIER, F.I.C., F.C.S.

My attention has just been called to a paper by Messrs. Dechan and Maben on "The Strength and Condition of Commercial Specimens of Hydrargyrum cum Cretâ, Pilula Hydrargyri and Unguentum Hydrargyri,"² read at the Hastings meeting of the British Pharmaceutical Conference. This paper is an attempt to further elucidate the question of the existence or non-existence of oxides of mercury in these preparations, and gives the results of the examination of some commercial samples of each of them, including an estimation of the metallic mercury and the two oxides. The results obtained by Messrs. Dechan and Maben may be summarized as follows: In hydrargyrum cum cretâ they find a considerable proportion of oxides of mercury, in one sample as much as 6.15 per cent. of mercurous oxide and 2.8 per cent. of mercuric oxide. In pilula hydrargyri, out of eight samples examined, in six they failed to find any trace of oxides, although one mass was four years old. In unguentum hydrargyri, out of twelve samples examined, in two only was oxide found, and in these only a very small percentage. These results are so materially opposed to those obtained by myself in an investigation of the same subject as to indicate an error on the part of one of us, either in method or experiment. This is particularly the case in regard to pilula hydrargyri, the results of my examination of which I recorded in a communication to the Pharmaceutical Society in February, 1876.³

The method adopted by Messrs. Dechan and Maben for the estimation of the oxides of mercury is to digest the substance under examination in hot or boiling acetic acid, and after washing the residue with the same menstruum to treat the acid solution, supposed to contain the two oxides as acetates, first with hydrochloric acid to precipitate mercurous chloride, and then with sulphuretted hydrogen to precipitate

¹ Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Wednesday, November 5, 1884.

² "Phar. Jour.," Series iii, No. 743, p. 230; "Am. Jour. Phar.," 1884, p. 554.

³ "Phar. Jour.," Series iii, No. 293, p. 621; "Am. Jour. Phar.," 1876, p. 143.

mercuric sulphide. From the weight of these salts, after drying, is calculated the amount of oxides present in the sample.

The method which I have used for the estimation of the oxides in the pharmacopœial preparations of mercury is first to digest the sample in hydrochloric acid to dissolve the mercuric oxide; to this solution, after neutralizing excess of acid with ammonia, stannous chloride is added and the reduced metallic mercury separated, dried over sulphuric acid and weighed; from this weight is calculated the amount of mercuric oxide present. To estimate the mercurous oxide a fresh portion of the sample is digested in a 5 per cent. solution of hydrocyanic acid, which converts the mercury of the mercuric oxide into mercuric cyanide and also so converts half the mercury of the mercurous oxide, leaving the remainder as metallic mercury. The hydrocyanic acid solution is treated with stannous chloride, in the same manner as the hydrochloric acid solution, and from the weight of metallic mercury obtained the weight of mercury existing as mercuric oxide is subtracted, and the remainder doubled, this result calculated into mercurous oxide gives the quantity present in the sample. This method for the estimation of mercurous oxide is based on some observations of Scheele on the action of hydrocyanic acid on oxides of mercury, and is more fully described in my paper on "The Composition of *Pilula Hydrargyri*" (*Pharm-Journ.*, February 5, 1876). In that paper I gave the results of the examination of nine commercial samples of *pilula hydrargyri*, the oxides in which were estimated by the method I have just described. In each case, with one exception, the age of the sample was determined as accurately as possible. The age of the samples varied from eighteen hours to two years, and the percentage of oxides from a trace to 1.80 of mercuric oxide, and from .25 to 4.22 of mercurous oxide. The proportion of oxides present bore such a striking relation to the age of the samples as to lead me to the conclusion that the proportion of oxides increases with the age of the sample, and that machine-made masses oxidize more rapidly than those made by hand.

After trying Messrs. Dechan and Maben's method on some commercial samples of *pilula hydrargyri*, and failing to find but a trace of oxides in them, while by the method which I had formerly used I found distinct quantities, I decided to try the two methods on a sample containing a known quantity of one of the oxides. As mercurous oxide exists in mercurial preparations to a much greater extent than mercuric I considered it the most suitable for the purpose, and after preparing a

fresh sample of pilula hydrargyri I added to it 5 per cent. of freshly precipitated mercurous oxide, and submitted portions of this mass to a careful analysis by the method employed by Messrs. Dechan and Maben, and by the hydrocyanic acid method I have described. The results were :

Hydrocyanic acid method.....	4.72 p.c. Hg_2O .
Messrs. Dechan and Maben's method.....	.250 " "

Although there is no doubt more than one source of error in the process of Messrs. Dechan and Maben which contributes to this result, there can be little doubt that the most important one is the instability of mercurous acetate in presence of organic matter, especially glucose, it being rapidly reduced even at ordinary temperatures to oxide, a change which would be still more readily brought about by hot digestion. In support of this explanation of the opposite results obtained by Messrs. Dechan and Maben and myself is the fact that in hydrargyrum cum cretâ, a preparation free from organic matter and which, in my experience, is less liable to oxidation than pilula hydrargyri or unguentum hydrargyri, their process gives results coinciding very closely with my own and those of other workers on the same subject.

When I completed my examination of blue pill in 1876 I preserved samples of each mass analysed, and thinking the present opportunity a fitting one, I have again estimated the quantity of oxides in one of these samples which eight years ago contained .24 per cent. of mercuric oxide and .62 per cent. of mercurous oxide, but which I now find to contain 1.20 per cent. of mercuric oxide and 3.62 per cent. of mercurous oxide, thus affording another proof of the theory that the oxides of mercury, which undoubtedly exist in all samples of pilula hydrargyri, increase with the age of the sample.—*Phar. Jour. and Trans.*, November 8, 1884, p. 363.

In the discussion upon the foregoing paper Mr. Umney stated that a sample of blue pill made about six months had contained about 2 per cent. of mercurous and 1.2 per cent. of mercuric oxide. Blue pill made by machinery is slightly contaminated with iron, and this reacting with the astringent principle of rose leaves may cause a change of color. Blue pill is generally made by triturating metallic mercury with confection of roses in the bed of a large mill, the stones being of granite and a sweeper frequently made of iron following the stones in their circuit. Mr. Umney prepares gray powder in a similar manner by triturating well dried prepared chalk with mercury under granite stones, the process for 100 pounds occupying seven or eight hours.

Professor Redwood referred to his investigations made in 1860, when in examining a gray powder, which from its effects was supposed to contain arsenic or antimony, numerous samples were found to be free from these impurities, but to contain variable amounts of the oxides of mercury. In his analysis then made he discarded acetic acid and treated mercurial preparations first with hydrochloric acid and subsequently with hydrocyanic acid. He had frequently observed mercury with chalk to be contaminated with the two oxides of mercury, but not blue pill, except to a small extent. Mercury and chalk prepared by simple trituration in a mortar is, and has long been held to be, a valuable and perfectly safe preparation. But on putting the ingredients with several large pebbles into a cask, which is fastened up and turned by a steam-engine, the mercury is subjected to conditions in which oxidation takes place to a great extent; working under stone runners it would not be subject to the same oxidizing action. In blue pill oxidation may take place whilst the mechanical trituration is being effected; but that portion of the mercury which is in the metallic state incorporated with the conserve of roses, cannot undergo a continuous process of oxidation.

Mr. Schacht urged upon pharmacists to make hydrargyrum cum cretâ themselves, its oxidation being doubtless entirely a question of age. Mr. Gerrard coincided with this recommendation and extended it to other mercurial preparations which should be made at periods of about three or six months, so as to insure having them in a fresh condition, free from the injurious oxides.

MINUTES OF THE COLLEGE.

PHILADELPHIA, December 29, 1884.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the hall of the College, No. 145 N. Tenth street.

In the absence of the President William B. Webb was called to the chair. Fourteen members were present and signed the register.

The minutes of the last meeting were read and on motion adopted.

The minutes of the Board of Trustees for October, November and December were read by the Secretary of the College, and on motion approved.

These minutes contained the report to the Board of the Committee of Instruction, relative to the subject of preliminary examination of students in the English branches before entering the Junior Class.

Upon this subject considerable discussion took place, and Messrs. Blair

and Thompson thought that the examination, as conducted was not of a preliminary character in a proper sense, and requested an explanation of the working of the system adopted. They both expressed fears that it would be found to work unsatisfactorily.

Professors Remington and Sadtler explained the mode of examination as recently conducted, and gave it as their opinion that it had worked well so far, and gave promise of a satisfactory result at the end of the course. Messrs. Bullock, Boring and McIntyre acquiesced in these opinions.

Resignations were then read from the following gentlemen, members of the College, viz. : Messrs. Frederick C. Orth, John A. Witmer and Charles A. Kurlbaum. On motion they were all accepted.

Then on motion adjourned.

WILLIAM J. JENKS, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, December 16, 1884.

President Dillwyn Parrish in the chair.

The minutes of the last meeting were read and approved.

Prof. Trimble made some remarks upon *burdock fruit and oil*, only to state that in the chemical examination he had obtained indications of an alkaloid, which was being further investigated.

Prof. Trimble also read a paper upon *Polygonum Hydropiper*, or smartweed, which was referred for publication.

Prof. Remington read a paper upon the *advances in the instruction and requirements* of the Philadelphia College of Pharmacy. After the reading of the paper, the questions propounded for a preliminary examination in a Pharmaceutical institution were read and commented upon.

Mr. Thompson stated that he had listened attentively to the reading of the paper and was pleased to learn so much in regard to the courses of instruction; he must still say that he differed from the writer in one respect, that was that the methods pursued did not improve the character of the trade. We all know, he said, that it has degenerated, and he thought it was in part owing to the course of the College in not requiring its students to attain a certain standard before entering.

Professor Maisch said that in all European countries the laws required that a young man on *entering* the drug business as an *apprentice* should prove certain educational acquirements; but after such entrance there was no discrimination against obtaining further instruction in the pharmaceutical institutions.

Mr. Zeller presented a fine specimen of *kryolite*, and called attention to the specimens of *licorice* and *ammoniacal glycyrrhizin* made by Mellor & Rittenhouse and presented to the College Cabinet.

Mr. Wallace Procter presented a number of specimens of different articles that were the results of studies and examinations conducted by his father, the late Professor Procter. They were accepted with thanks.

A specimen of *Irish broom*, collected on the line of the Baltimore Railroad. Prof. Maisch stated that many years ago *scoparius* grew plentifully near Fairmount avenue and Twenty-second street.

There being no further business, on motion, adjourned.

T. S. WIEGAND, *Registrar*.

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.

The third social meeting was held at the College hall on the afternoon of December 9, the President, Dr. C. A. Weidemann, in the chair. A very interesting lecture was delivered by Dr. J. M. Anders, the subject being "Diet and Drink." The lecturer passed in review the different classes of food—nitrogenous and non-nitrogenous, animal and vegetable, and the various drinks—water, milk, fermented liquors, coffee, tea, etc., and alluding to the physiological observations made with many of these, showed the adaptability of the different articles under various conditions. In the discussion following several speakers took the ground that wheat starch, which is cheaply produced in this country, is in every respect the dietary equivalent of the high-priced arrow-roots of tropical countries.

After various recitations and the reading of a paper, entitled "What is the Best Way to Wait on a Customer," the meeting adjourned.

EDITORIAL DEPARTMENT.

THE ENDORSING AND VENDING OF NOSTRUMS BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.—Under this caption Mr. A. E. Ebert has sent us a communication, which we print below, and which seems to be intended to correct an error in the communication published on page 654 of our December number. Mr. Ebert apparently assumes that Mr. Shoemaker's remarks refer to the *representatives* of the American Pharmaceutical Association who were present at the St. Louis meeting of the National Wholesale Druggists' Association, while in point of fact, no allusion whatever was made to that delegation, Mr. Shoemaker distinctly saying: "There were present . . . a very respectable delegation from the National Retail Druggists' Association . . . some at least prominent *members* of the American Pharmaceutical Association." This fact is not disputed by Mr. Ebert, and the two sentences which we have italicized in his communication, clearly show that the facts, as stated by Mr. Shoemaker, are in accord with those observed by Mr. Ebert. The present communication, therefore, cannot be regarded as a *correction* of the previous one; but it is a *supplement* thereto, and an important one, since it shows that the delegation of the American Pharmaceutical Association was on the alert of avoiding compromises, repugnant to the history of the Association since its foundation. A synopsis of the position of this Association to nostrums and

secrecy in medicines was given by the Secretary at the meeting at Niagara Falls, and is published in the *Proceedings* for 1882, pages 641 and 642.

To the Editor of the American Journal of Pharmacy :

The December number of the "American Journal of Pharmacy" contains a communication from Mr. Robert Shoemaker, which in my opinion does great injustice to the membership of the American Pharmaceutical Association. Mr. Shoemaker makes the statement that at the St. Louis meeting of the National Wholesale Druggists' Association prominent members of the American Pharmaceutical Association were in attendance in the interest of nostrums, and the course pursued by them appeared as an endorsement of the importance and efficiency of this class of pretentious cure-alls and quack medicines. He further says: "I cannot help feeling that the worthy gentlemen *who participated in the debates on this subject* forgot for the moment their high calling as members of a truly honorable profession, and lost dignity in asking the convention to endorse as legitimate the very articles against which they should set their faces."

The writer confesses his inability to explain how the delegation of the American Pharmaceutical Association could be confounded with the officials of the National Retail Druggists' Association who were present at this meeting, and were so prominent in the debates and so active in urging upon the wholesalers the importance and necessity of the adoption of the so-called "Campion" or nostrum plan. It certainly was no fault of these gentlemen if those present were not impressed with the importance of their representations; for they claimed as their constituency the retail druggists of this hemisphere, or more correctly speaking, the space bounded on the east by the Atlantic and on the west by the Pacific ocean, to the north by Hudson Bay and to the south by the Gulf of Mexico; or in other words, if the space is not "figuratively" speaking empty, it means representing from 30,000 to 50,000 druggists.

When the delegation of the American Pharmaceutical Association presented their credentials, the chairman, Mr. Eno Sander, conveyed in a very happy manner fraternal greetings, and in a few brief remarks stated the objects of the American Pharmaceutical Association, the work undertaken and performed in the past, the work laid out for the present and future, coupling with this the hope that the National Wholesale Druggists' Association would be found in the ranks, marching side by side, and shoulder to shoulder with the American Pharmaceutical Association in the noble struggle of promoting the progress and elevating the profession of Pharmacy in this country.

Subsequently, when the report on adulteration of drugs, and the recommendations from the committee as to what active measures be at once taken to expose and bring to punishment the guilty, was read and adopted, the writer asked the privilege of making a few remarks; this being granted, he, in behalf of the American Pharmaceutical Association, thanked the National Wholesale Druggists' Association, for the adoption of the report and the seeming very practical recommendations for correcting the existing evil, with which the American Pharmaceutical Association had been battling for the last thirty-three years, and it was most gratifying to learn that henceforth the two associations would be joined hand-in-hand in this labor of making marketable only pure and honest drugs.

The writer was present at all the sessions of the St. Louis meeting, and heard all the debates, and he does positively state that *at no time were there any remarks made by the representatives of the American Pharmaceutical Association, either pro or con, on the subject of nostrums* under consideration by the Association. The delegation was very careful of not having the American Pharmaceutical Association connected with this question in any manner whatever; and when a manufacturer of this class of goods,

while advocating the Campion plan, undertook to drag in the American Pharmaceutical Association as endorsing the plan, the writer interrupted the speaker, and asked the gentleman to correct his statement as far as it related to the American Pharmaceutical Association, as the delegation present were in position to say that this Association did not favor the Campion or any other plan that *furthered the interests of nostrums*. The gentleman who had made the allusion accepted our corrections, and this adds to our perplexity of Mr. Shoemaker's charges, when he says: "One might have supposed, in listening to their long-continued and eloquent efforts, that the chief part of the business of the modern apothecary consisted in buying and selling proprietary remedies, secret preparations, of which they know nothing beyond the printed name, accompanied by certificates of those who had been miraculously cured by their use."

If Mr. Shoemaker will make the correction, that the remarks that were made at this meeting upon this subject of quack medicines, were not made by representatives of the American Pharmaceutical Association we will admit that it was a deplorable situation to listen to the remarks of men who are at the head and front of the National Retail Druggists' Association, and by their cringing and whining appeals brought the tingling of shame upon the cheeks of all such who have the welfare of Pharmacy at heart. However, a lesson can be learned, and attached is a moral: Scan the representations of the Colleges of Pharmacy located east of the Alleghanies at the Milwaukee meeting of the American Pharmaceutical Association.

If Pharmacy is degenerating, where are the existing evidences of it? Where is the dangerous shallow shore with its hidden reefs and turbulent surf? Let us from this time on place competent and tried men at the helm of our ship of organization and we will be certain to steer clear of the breakers, whether they are east or west, north or south, and should the sea become too heavy, we will lighten our craft by throwing overboard the nostrums, regain the deep and safe wide expanse of the open, calm sea, and make a prosperous journey in our ship of Pharmacal Progress.

Respectfully,

ALBERT E. EBERT.

CHICAGO, December 23, 1884.

DESTRUCTION OF SCIENCE HALL, UNIVERSITY OF WISCONSIN.—On the evening of December 1, a fire broke out in the engine room of Science Hall, one of the buildings of the University of Wisconsin, at Madison. It resulted in the total destruction of the building, which was four stories in height, the central building being 79 by 52 feet in dimension, while the two wings were 109 feet long and 42 feet wide. The cost of the building exceeded \$94,500, independent of its furnishings and later expensive improvements, and it contained besides various lecture rooms, laboratories for investigations in physics, chemistry and mineralogy, and collections of art and natural history. Many of the specimens cannot be replaced, and the results of years of labor by several of the professors have been lost.

Serious as the loss has been by this calamity, the faculty, with commendable energy, proceeded at once to make the best possible arrangements for continuing without interruption the instruction of the students in the remaining buildings. The pharmaceutical, botanical, and agricultural departments were not directly sufferers, though they naturally must experience more or less inconvenience through the destruction of the laboratories and cabinets mentioned above.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Manual of Organic Materia Medica. Being a Guide to Materia Medica of the Vegetable and Animal Kingdoms, for the use of Students, Druggists, Pharmacists and Physicians. By John M. Maisch, Phar. D., Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy. Philadelphia: Lea Brothers & Co., 1885. 12mo. pp. 511.

Just three years ago the first edition of this work was published; it was noticed on page 39 of this Journal, 1882. The edition was completely exhausted fifteen months ago; but the appearance of the second edition was delayed owing to the author's labors in connection with the recently published "National Dispensatory." In the work now before us the arrangement of the material remains substantially the same as before, but somewhat more prominence has been given to the histological characters of vegetable drugs, and those drugs, which are no longer recognized by the United States Pharmacopœia, as a rule, are distinguished by the more closely printed text from the pharmacopœial drugs, among the latter being included several of which preparations or constituents only have been admitted into the Pharmacopœia, like *Cocculus indicus*, which is not recognized by the Pharmacopœia, except through its poisonous constituent picrotoxin. A number of drugs have also found a place in the Manual which have been recently recommended, and others of American origin which are in more or less extended use in different sections of the country. While the number of drugs treated of has thus been increased, the text has been revised so as to embrace the results of all investigations, as far as they come within the scope of the work. A number of the old wood cuts have been replaced by new and more characteristic ones, and others have been added where it was deemed desirable, the total number being 242, or an increase of about 50. A list of "drugs arranged according to origin" covering 22 pages, has been added; it embraces both drugs derived from animals and from plants. The latter list is necessarily the largest of the two and will be useful for the comparison of drugs furnished by botanically allied plants, and will also be of service to the student of medical botany. That paper and typography are excellent need merely be mentioned.

The Basic Pathology and Specific Treatment of Diphtheria, Typhoid, Zymotic, Septic, Scorbutic and Putrescent Diseases Generally. By Geo. J. Ziegler, M. D., etc. Philadelphia: Geo. J. Ziegler, M. D., 1884. 8vo, pp. 225. Price \$2.

The author endeavors to show that the diseases mentioned upon the title page are dependent upon, or complicated with, one common basic, alkaline, pathogenic factor, mostly the volatile alkali ammonia, and that the successful treatment must be based upon the neutralization or removal of this morbid factor. The subject is discussed under the following headings: 1. Introduction; 2. Ætiology and Pathology; 3. Treatment; 4. External Treatment; 5. Prevention; 6. Conclusions.

The Life Work of Carl Wilhelm Scheele. By B. Frank Hays, Ph.G. New York: P. W. Bedford, 1884. Pp. 14.

The paper was read before the Alumni Association of the College of Pharmacy of the City of New York, and published in the "Pharmaceutical Record," December 1, 1884.

List of Tests (Reagents) arranged in alphabetical order according to the names of the originators. Translated from the German of Mr. Schneider (Dresden), with additions from various sources. By Hans M. Wilder. New York: P. W. Bedford, 1884.

This list contains one hundred and sixty-four tests, which need some corrections. The test for carbolic acid with pine wood moistened with hydrochloric acid is attributed to Hoppe-Seiler, but was first suggested by Runge. Jungmann's test with phosphomolybdic acid and ammonia was recommended for arbutin, not for alkaloids. Dragendorff recommended testing for alcohol in essential oils by sodium; the test giving potassium in place of sodium is erroneously attributed to Maisch, who recommended caustic potassa for the detection of nitrobenzol in oil of bitter almonds.

Fifth Annual Report of the State Board of Health, Lunacy and Charity of Massachusetts. Supplement containing the Report and Papers on Public Health. Boston: Wright & Potter Printing Co., 1884. 8vo, pp. 282.

Of particular interest to pharmacists are the reports of the analysts on food, milk and on drugs, and a paper entitled "Arsenic as a domestic poison." In glancing over these reports we have not observed that any new hitherto unknown adulterants have been detected. The last paper mentioned shows that arsenical colors for papers and arsenical dyes are still largely used, although their dangerous character has been often shown.

The Plaster of Paris Dressing in the Treatment of Fractures. By W. O'Daniel, M. D., Bullards, Georgia.

Reprint from the Transactions of the Medical Association of Georgia.

Pharmaceutical Journals.—A year ago "New Remedies" changed its title to "American Druggist," and the "St. Louis Druggist" to the "National Druggist." Now the "Druggist" published in Chicago has been converted into the "Western Druggist." This last mentioned paper has at the last meetings of the American and of the Illinois Pharmaceutical Associations published daily editions containing not merely a synopsis of the business done at these meetings, but likewise a good portion of the discussions and the papers, in abstract or entire, which were read at the meetings.

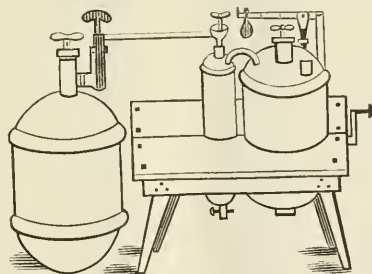
The "Pharmacist," which is published by authority of the Chicago College of Pharmacy, has been placed under the editorial management of Prof. Oscar Oldberg, whose learning and experience in pharmaceutical practice, literature and education will doubtless be impressed upon the course of our valued cotemporary.

OBITUARY.

JOSEPH JANVIER WOODWARD, M. D., Major and Brevet Lieut. Colonel U. S. A., died near Philadelphia, August 18th, aged fifty-two years. He graduated from the University of Pennsylvania in 1853, was appointed Assistant Surgeon U. S. A. in 1861, and in 1866 was assigned to the duty of editing the "Medical and Surgical History of the War of the Rebellion." His labors in connection with this work as well as with the Army Medical Museum, and more particularly his microscopical researches and photographing, gained for him a world-wide reputation. Dr. Woodward had been ailing for several years, and on several occasions visited Europe for the benefit of his health.

ROBERT EMPIE ROGERS, M. D. died suddenly in Philadelphia, September 6th, last, aged seventy years. He graduated in medicine from the University of Pennsylvania in 1836, was afterwards Professor of Chemistry in the University of Virginia, the University of Pennsylvania and the Jefferson Medical College. The chair in the last institution, made vacant by his death, was filled by the appointment of Prof. J. W. Mallett of the University of Virginia.

JAMES T. LUKENS died in Philadelphia November 30, being in the seventy-eighth year of his age. He learned the trade of carriage making, and was subsequently, for a number of years, engaged in the manufacture of mineral water, the firm being Lukens & Lippincott, and the business



from which Mr. Lukens retired many years ago being still carried on by the successors of the other partner. The annexed cut represents the first soda water apparatus constructed by the deceased.

We have been informed of the decease of the following graduates of the Philadelphia College of Pharmacy :

JOHN H. PALETHORP, Class 1854, graduated afterwards in medicine from the University of Pennsylvania, and was for a number of years engaged in the real estate business.

EDWARD JEFFERSON, Class 1873, died suddenly at Atlanta, Georgia, from an overdose of morphine taken to relieve uræmic convulsions.

JOHN L. WILLIAMS, Class 1874, was killed by being thrown out of a carriage near Bloomfield, Perry County, Pa., September 4th, last.

C. FRANK MOORE, Class 1877, died at North East, Md., of brain fever aged twenty-nine years. He was engaged in the drug business at Cherry Hill, Md.

ROBERT F. FINCK, Class 1884, died December 10, aged twenty-six years.

CLASS OF THE PHILAD' A COLLEGE OF PHARMACY.

SIXTY-FOURTH ANNUAL SESSION, 1884—1885.

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Young, Frank John,	Detroit,	Mich.	E. S. Power, M. D.
Young, Robert Taylor,	Coatesville,	Pa.	J. W. March & Co.
Young, William Schrack,	Philada.,	Pa.	W. H. Llewellyn.

SENIOR CLASS.

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Abou, Joseph William,	Clinton,	Miss.	Dr. P. Fitch.
Amnden, Geo. Sidney,	Manchester,	Iowa.	E. J. Congar.
Anthis, Philip,	Pittsburg,	Pa.	J. L. Wessel.
Ball, John Alexis,	Philada.,	Pa.	R. D. Jones, M. D.
Barker, James Henry,	Plaquemine,	La.	S. Hiriart.
Bartel, Max,	Milwaukee,	Wis.	F. W. Hartwig.
Bechberger, Henry,	Sandusky,	Ohio.	S. H. Emrick.
Bell, Robert Matthew,	Philada.,	Pa.	Dr. C. J. Nice.
Bender, William Piper, Jr.	Camden,	N. J.	Dr. J. R. Agney,
Bichy, William,	Buffalo,	N. Y.	W. A. Rumsey.
Biddle, Richard,	Philada.,	Pa.	
Bishop, Samuel Walter,	Beverly,	N. J.	H. C. Van Meter.
Bissell, Wayne Barker,	Waterville,	N. Y.	E. G. Bissell.
Bogart, Chas. Mount,	South Amboy,	N. J.	G. W. Jacques.
Bowers, Luther Pascal,	Jefferson,	Md.	Warrington & Pennypacker.
Bozenhard, William Theodore,	Dayton,	Ohio.	Benker & Co.
Braddock, Chas. Shreve,	Haddonfield,	N. J.	Isaac A. Braddock.
Brandner, Henry, Jr.,	Atchison,	Kansas.	G. A. Chapman & Co.
Brehman, Charles Schaeffer,	Philada.,	Pa.	
Brown, Albert Edward,	Mobile,	Ala.	B. Ward.
Brown, Frank L.,	Chester,	Pa.	J. M. Stover.
Bullock, William Anthony,	Philada.,	Pa.	Bullock & Crenshaw.
Burke, Wm. Thompson,	Bristol,	Pa.	Alex. Kennedy.
Cadmus, Robert Clark,	Philada.,	Pa.	Dr. W. J. McCleane.
Cafky, Wm. Walter,	Jacksonville,	Ill.	W. E. Lee.
Cahoon, Edward Daley,	Dover,	Del.	F. Rapp.
Carnan, George Lewis,	Mt. Laurel,	N. J.	G. M. Snyser.
Champion, Carleton Cole,	Philada.,	Pa.	Bullock & Crenshaw.
Christ, Chas. Wesley,	Selinsgrove,	Pa.	E. J. Lehman.
Cohen, Nathan Alexander,	Selinsgrove,	Pa.	H. A. Borell.
Coltman, Thos. Clement,	Jenkintown,	Pa.	J. W. Ridpath.
Cooley, James Sherman,	Flemington,	N. J.	A. B. Allen.
Craythorn, Chas. John,	Beverly,	N. J.	A. W. Taylor, M. D.
Crothers, Samuel Ross,	Zion,	Md.	F. W. E. Sedem.
Dallett, Prosper Martin,	Philada.,	Pa.	Bullock & Crenshaw.
Davis, Fred. Horace,	Camden,	Del.	T. O. Nock.
Davison, Blythe James,	Canton,	Pa.	N. W. Whitman.
Deakye, Oscar Boone,	Wilmington,	Del.	J. H. Morgan.
Deem, David Ferguson,	Union City,	Ind.	D. H. Ross.
De Long, Wm. Edward,	Bangor,	Pa.	S. F. Ware.
Dennison, Ulysses Grant,	New Castle,	Del.	H. C. Walker.
Dennison, Geo. Eicholtz,	Downington,	Pa.	J. V. Antill.
Denniston, Wm. Milliken,	Holidaysburg,	Pa.	P. H. West.
De Reeves, Eugene,	Trinity,	Texas.	G. W. Shingle.
Deusche Wm. Dilk,	Chillicothe,	Ohio.	John A. Nippen.
Dickeson, Morton Phelps	Media,	Pa.	W. T. W. Dickeson, M. D.
Diefenbeck, Henry,	Allegheny City,	Pa.	J. T. Hoskinson, Jr.
Dielman, Louis Henry,	New Windsor,	Md.	T. O. Nock.
Donough, Wm. Edgar,	Bernville,	Pa.	M. A. Davis.
Dreiss, Edward Frederick,	San Antonio,	Texas.	Adolph Dreiss.
Drew, Daner,	Warsham,	Va.	H. C. Manlove.
Dunbar, Thomas, Jr.	Philada.,	Pa.	J. W. Dallam & Co.
Dunn, Fred.,	Philada.,	Pa.	J. M. Rudolph.
Dunn, Walter,	Clifton Heights,	Pa.	A. Tatem.
Ebeling, Geo. Henry,	Wheeling,	W. Va.	Thos. H. Potts.
Eberly, Jacob Addison,	Mechanicsburg,	Pa.	Dr. H. Muller.
Edmonds, George Washington,	Philada.,	Pa.	Martin & Sommers.
Eisenhart, Foster Benjamin,	Hellertown,	Pa.	Wm. F. Owens.
Eldredge, Joseph Johnson,	Cape May City,	N. J.	Marcy & Mearay.
Ely, Samuel S.,	Philada.,	Pa.	Wiley & Harris.
Engler, John George,	Hartford,	Conn.	A. Maverick & Co.
Evans, Geo. Brinton,	Plymouth,	Pa.	D. K. Spry.
Fahey, Edward H.,	Wilmington,	Del.	H. K. Watson.
Feaircheller, Theodore,	Philada.,	Pa.	W. H. Lacey.
Fetter, Henry Hermann,	Philada.,	Pa.	J. A. Witmer.
Fetterolf, Daniel Webster,	Ashland,	Pa.	S. A. Marshall.
Fienhohl, Edward Henry,	Philada.,	Pa.	G. A. Bachman.
Fischer, Albert Martin,	Philada.,	Pa.	G. W. Notson.
Fritsch, Harry,	Philada.,	Pa.	W. R. Warner & Co.
Gable, Ralph Benton,	Reading,	Pa.	Wm. Weis.
Gebhard, Adolph Emil,	Muskegon,	Mich.	J. Jenson.
Gehris, Peter Spang,	Reading,	Pa.	J. B. Raser.
Georges, Amandus George,	North Java,	N. Y.	H. Opperman.
Giffin, Henry Riggeal,	Philada.,	Pa.	F. E. Morgan.
Green, Benj. Wallace,	Millington,	Md.	W. C. Ebaugh, M. D.

Matriculants.	Town or County.	State.	Preceptor.
Griffin, Cyrus Byer,	Lewisburg,	Pa.	H. C. Watt.
Groom, Ellerslie Wallace,	Bristol,	Pa.	Dr. H. Pursell.
Groom, Joseph,	Philada.,	Pa.	Hance Bros. & White.
Haffa, George Adam,	Philada.,	Pa.	W. R. Warner & Co.
Hagenbuch, James Hervy,	Mahonoy City,	Pa.	C. C. Hagenbuch.
Hall, Jesse Barklay,	Norristown,	Pa.	Attwood Yeakle.
Hammond, Arthur Browne,	Baltimore,	Md.	E. Ball.
Hamilton, Will., Swearingen.	Fairmont,	W. Va.	Carr Bros.
Harper, Wm. Franklin,	Madison,	Ind.	J. E. C. F. Harper.
Harrington, Silas Marion,	Plano,	Texas.	S. J. Rogers, M. D.
Harris, Clinton Kelly,	Salem,	N. J.	J. T. Shinn.
Harris, Norton O.,	Dover,	Del.	S. Levin Dilks.
Hassler, Daniel Herr,	Carlisle,	Pa.	S. S. Bunting.
Haynsworth, Julius Dargan,	Darlington,	S. C.	Dr. J. A. Boyd.
Heider, Henry George,	Fon du Lac,	Wis.	G. Bille.
Heim, Henry Lewis,	Philada.,	Pa.	Aschenbach & Miller.
Henderson, James Ashton,	Maytown,	Pa.	Bullock & Crenshaw.
Heintish, Harry Ernest,	Philada.,	Pa.	J. P. Remington.
Herrman, Ralph Christian,	Allentown,	Pa.	A. Weber.
Hess, Edwin Hutter,	Harrisburg,	Pa.	Thomas Combs.
Hiestand, John Summy,	Mt. Joy,	Conn.	D. G. E. Musselman.
Howells, James Owen,	Bridgeport,	Pa.	F. Zimmer.
Hunter, James, Jr.,	Philada.,	Pa.	D. H. Ross.
Hunter, James Stanton,	Pittsburg,	Pa.	M. M. Schneider.
Hurd, George Edward,	Philada.,	Pa.	Dr. W. H. Jayne.
Jacobson, Frank Edward,	Bethlehem,	Pa.	C. Jacoby.
Jones, Harry Ellsworth,	Mt. Holly,	N. J.	J. J. Ottinger.
Johnson, Elmer Ellsworth,	Shenandoah,	Pa.	S. C. Spalding.
Johnston, Frank Elmer,	Clifton Heights,	Pa.	H. M. Brennan.
Kalteyer, Moritz,	San Antonio,	Texas.	G. H. Kalteyer.
Keller, Alexander George,	Philada.,	Pa.	G. H. Tolboldt.
Ketcham, Stephen Rush,	Philada.,	Pa.	D. L. Stackhouse.
Keyes, Frank Williamson,	York,	Pa.	L. E. Sayre.
Kirk, Grant Elmer,	Philada.,	Pa.	J. W. Kohlerman.
Kirkham, Walter Agan,	Newark,	N. Y.	M. M. Kenyon.
Kisner, Charles Nelson,	Berwick,	Pa.	R. H. Little.
Knight, Howard,	Bucks Co.,	Pa.	W. Procter, Jr. & Co.
Knisell, Sidney Lackey,	Woodbury,	N. J.	Bullock & Crenshaw.
Koch, Charles Herman,	Carlisle,	Pa.	J. T. Shinn.
Kuehnel, Gustav. Fred.,	Milwaukee,	Wis.	L. Oliphant.
Kunkel, Wm. Evans,	Harrisburg,	Pa.	H. C. Blairs' Sons.
Kyle, Elmer Bryan,	York,	Pa.	J. L. Bispham.
Kyner, James Almer,	Orrstown,	Pa.	J. C. Altick & Co.
Lammer, Francis Joseph, Jr.,	Philada.,	Pa.	J. Wyeth & Bro.
Landis, Frank Theodore,	Palmyra,	Pa.	Dr. W. C. Kline.
Lautenbacher, Irvin Lincoln,	Schuylkill Haven,	Pa.	H. C. Mohr.
Laval, Wm. John,	Evansville,	Ind.	J. Laval.
Lawrence, Samuel Comfort,	Attica,	N. Y.	Dr. Snitcher.
Lewis Llewellyn Hughes,	Chester,	Pa.	Lockard & Jones.
Lichtenburger, Fred'k Jacob,	Freeport,	Ill.	Fred. Weise.
Lochman, Chas. Napier,	Bethlehem,	Pa.	Simon Rau & Co.
McCarthy, Cornelius Joseph,	St. Clair,	Pa.	Bullock & Crenshaw.
McFarland, Thaddeus Day,	Hudson,	Ohio.	E. S. Bentley.
Maisch, Henry Charles Christian,	Philada.,	Pa.	Dr. L. Wolff.
Malatesta, Joseph Mark,	Philada.,	Pa.	J. H. Blake.
Mallon, James Peter,	Philada.,	Pa.	J. M. Fronefield.
Marbourg, John George,	Bedford,	Pa.	C. Shivers.
Matter, Robert Borton,	Lewistown,	Pa.	
Mauch, Chas. Milton, Jr.,	Hellertown,	Pa.	J. T. White.
May Rollin R.,	Wilmington,	Del.	G. W. Knight.
Mayer, Chas. Eugene,	Bovertown,	Pa.	L. Seifel.
Meissner, Paul Ernest,	Milwaukee,	Wis.	Baumbach & Rosenthal.
Mitcheson, Robt. Stockton Johnson,	Philada.,	Pa.	W. R. Warner & Co.
Moore, John Demuth,	Wrightsville,	Pa.	P. S. Brugh.
Morrett, Wm. Henry,	Mechanicsburg,	Pa.	J. A. Shelly.
Morrison, James,	Roxboro,	Pa.	W. M. Morrison.
Morse, Frank,	Hanover,	Ind.	G. W. Kylius.
Moses, Matthew Ulysses S. Grant,	Trenton,	N. J.	R. H. Vansant.
Mount, Elmer Marshall,	Wilmington,	Del.	B. R. Veasey.
Moyer, Edwin Oliver,	Catasauqua,	Pa.	C. B. Lowe & Co.
Naudain Edgar Harman,	Wilmington,	Del.	W. B. Danforth.
Nebig, Wm. George,	Philada.,	Pa.	C. C. Hughes.
Nebinger, Jacob Lewis,	Philada.,	Pa.	T. S. Wiegand.
Newton, John W.,	Gallipolis,	Ohio.	James H. Sams.
Odenwelder, Harry S.,	Easton,	Pa.	R. Shoemaker & Co.
Pancoast George Widdifield,	Moorestown,	N. J.	J. W. Worthington.
Parrish Callistus Mitchell,	Ebensburg,	Pa.	William Lemmon, M. D.
Patterson, Albert Raymond,	Zanesville,	Ohio.	W. H. Barnes.
Pechin, Edgar Vogan,	Philada.,	Pa.	G. H. Johnson.
Pechmann, Wm.,	Bremen,	Germany.	L. Dembinski.
Pemberton, Samuel Lovering,	Phil da.,	Pa.	Bullock & Crenshaw.

Matriculants.	Town or County.	State.	Preceptor.
Peters, Leopold,	Fulton,	Ill.	Leslie Williams.
Pfeifle, Robt Wm.,	Philada.,	Pa.	L. Wolff & Co.
Post, Philip Von Riper,	Philada.,	Pa.	W. B. Webb & Co.
Purdy, Frank Vansant,	Doylestown,	Pa.	Dr. G. T. Harvey.
Ramey, Chas. Clifton,	Norristown,	Pa.	W. S. Thornley.
Read, Clinton Hubert,	Wattsburg,	Pa.	George Holland.
Reagan, Dennis,	Easton,	Pa.	H. G. Haring.
Rebner, Chas. Morris,	Atchison,	Kan.	McPike & Fox.
Rebsamen, Chas. Fred.,	Leavenworth,	Kan.	G. Ummethun.
Reese, Birch Taylor,	Philada.,	Pa.	W. R. Warner & Co.
Reinholdt, Henry Otto,	Sheboygan,	Wis.	M. R. Zaegel & Co.
Reynolds, Walter,	Philada.,	Pa.	B. F. Shell.
Rhodes, Chas. Henry,	Philada.,	Pa.	
Rhoads, Wm. Stevens,	Hontzdale,	Pa.	Dr. J. W. Rhoads.
Ridington, Wm. Augustus,	Conshohocken,	Pa.	William McKenzie, M. D.
Riggs, Elias Ellsworth,	Heights town,	N. J.	Dr. G. E. Titus.
Roberts, Jos. Uttell,	Wilmington,	Del.	Smith & Painter.
Rosenzweig, Benj.,	Philada.,	Pa.	J. B. Moore.
Rossler, George Frederick,	Berlin,	Germany.	E. Jungman.
Santee, Andrew Curtin,	Town Line,	Pa.	W. C. Snillwell, M. D.
Saunders, Henry Scholey,	London,	Ontario (Can.)	Wm. Saunders.
Schaible, Emil,	La Fayette,	Ind.	E. B. Garrigues & Co.
Schlegel, Carl Edward,	Davenport,	Iowa.	Gus. Schlegel.
Schofield, Allen Curtis,	Piqua,	Ohio.	C. J. Biddle.
Schofield, Thos. La Blanc,	Philada.,	Pa.	Hance Bros. & White.
Schuchard, Herman Julius,	San Antonio,	Texas.	G. H. Katterer.
Scull, Andrew Stewart,	Atlantic City,	N. J.	Dr. M. West.
Schwartz, Fred.,	Philada.,	Pa.	E. W. Herrmann.
Seiler, Wm. Frederick,	Philada.,	Pa.	B. W. Fetters.
Serfass, Abraham Lincoln,	Easton,	Pa.	C. Lawall & Son.
Shaw, Henry Clay,	Piedmont,	W. Va.	Dr. W. A. Shuey.
Sher, Fred. Paul,	Philada.,	Pa.	Dr. Sher.
Sinne, Hans Heinrich,	Germany,	Prussia.	Dr. A. Nebeker.
Smith, Christopher Columbus,	Philada.,	Pa.	J. F. Wilgus.
Smith, George Mark,	Annuville,	Pa.	
Snively, Harry Barr,	Lancaster,	Pa.	S. B. McCleary.
Snyder, Harry Lincoln,	Mechanicsburg,	Pa.	H. A. Borell.
Stager, Edwin Wesley,	Lebanon,	Pa.	J. S. Armstrong, M. D.
Stearns, Moses,	Cincinnati,	Ohio.	C. A. Rutherford.
Steinecken, Geo. Augustus,	Wilmington,	Del.	Dr. W. S. Hitech.
Steinmetz, Wm. F.,	Philada.,	Pa.	M. G. Briggs.
Stermer, John Henry,	York,	Pa.	W. A. Burns.
Stichter, Henry D.,	East Greenville,	Pa.	E. B. Garrigues & Co.
Stiles, Henry Lippincott,	Moorestown,	N. J.	J. R. Stevenson.
Stinebeck, William Adam,	Columbia,	S. C.	Dr. D. S. Pope.
Stoll, Samuel Franklin,	Bucyrus,	Ohio.	C. A. Spence.
Strasser, John Jacob, Jr.,	Trenton,	N. J.	F. R. Jummel.
Swann, Samuel D.,	Fernandina,	Fla.	Horsey & Co.
Swain, Harry,	Georgetown,	Del.	S. D. Marshall, M. D.
Tatem, Harry Randolph,	Collingwood,	N. J.	J. W. Lutz.
Thieband, Hugh McCallum,	Vevay,	Ind.	A. W. Peck.
Thompson, Wm. Cochran,	Coatesville,	Pa.	Dr. L. Wolff.
Thompson, George Washington,	Titusville,	Pa.	M. Goldsmith.
Tift, Fred. Alden,	Camden,	N. J.	J. Griffith Howard.
Trefry, Thomas Crowell,	Yarmouth,	Nova Scotia.	Dr. C. A. Black.
Trout, Winfield Scott,	Philada.,	Pa.	W. R. Warner & Co.
Van Buskirk Samuel Levick,	Bethlehem,	Pa.	Van Buskirk & Apple.
Vannort, Wm. Augustus,	Hainesville,	Ind.	
Von Achen, Frank Herman,	Peoria,	Ill.	F. C. Bourscheidt & Bro.
Waln, Chas. Herbert,	Yardville,	N. Y.	L. E. Sayre.
Ward, Joseph Poletus,	Gaston,	Ala.	L. A. Podolski.
Watson, Maurice,	Bristol,	Pa.	S. Douglass.
Webb, Richard John,	Scranton,	Pa.	J. I. Rea, M. D.
Webster, Samuel C.,	Philada.,	Pa.	S. C. Webster.
Wegener, Henry,	Oshkosh,	Wis.	Geo. Phipps.
Weisel, Benjamin Franklin,	Elizabeth City,	N. C.	Wood & Wadsworth.
Wetteroth, Henry,	Bordentown,	N. J.	Bunting & Hankins.
Whilden, Chas. Bennett,	Charleston,	S. C.	G. I. McKelway.
Whitney, Heston,	Glassboro,	N. J.	J. G. Wells.
Wilkinson, Wm. John,	Philada.,	Pa.	C. A. Lang.
Williams, Neri Barndt,	Easton,	Pa.	E. T. Meyers.
Windolph, J. Frederick,	Dover,	Del.	T. C. Tomlinson, M. D.
Wittiger, Hugo Otto,	Kutztown,	Pa.	M. Shoffner.
Wood, Alfred Conard,	Hatboro,	Pa.	T. L. Buckman.
Woodill, Robert Wellesley,	Halifax,	Nova Scotia,	Avery, Brown & Co.
Wright, James Edward,	Philada.,	Pa.	F. E. Himmelwright, M. D.
Yost, Wm. Oscar,	Norristown,	Pa.	W. Stahler.
Zieher, Paul,	Hanover,	Pa.	B. A. Hertsch.

THE AMERICAN JOURNAL OF PHARMACY.

FEBRUARY, 1885.

THE ADVANTAGE OF PRELIMINARY EXAMINATION TO PHARMACY, AND TO THIS COLLEGE.

BY WM. B. THOMPSON.

Read at the Pharmaceutical Meeting, January 20, 1885.

If it should be thought that this paper is not entirely appropriate to the object of this meeting, its acceptance is asked for on the ground that it is in part a reply to a paper read at the December meeting, "On the Recent Advances in the Methods of Instruction in the Philadelphia College of Pharmacy," which paper and some subsequent remarks by its author are likely to lead to erroneous impression as to exactly what *is* meant, and what *is* contemplated by Preliminary Examination.

The present system, recently adopted by the College, of progressive or trial examinations of the junior students, was accepted by the Trustees as a step towards an ultimate view, upon careful consideration, and in deference to the openly expressed sentiment that some better means of discrimination in the materiel of the classes should be made. This tentative plan has not been favored, however, by those who advocate preliminary examination in its proper sense and relation, because it in no wise reaches the principle involved—it fails to afford the result desired, or to radically change the defect of method, and is, moreover, an act of injustice to the student.

The necessity of such a system as is now urged upon this College is based upon a wise precedent—upon the future welfare of pharmacy, upon the future status of the graduate, and upon the mutual relations of this institution to the profession at large—and further by reason of the fact that, so far as we are made aware, there is no inquiry instituted here on the entrance of a matriculant, or candidate, to determine his fitness, not only in reference to his rudimentary knowledge of pharmacy, nor as to his as much needed educational requirements in the common branches of learning. To read intelligently, to write legibly, to be creditably proficient in simple mathematics, and to

understand the primary construction of the Latin language, are clearly and plainly essential qualifications, and any young man not thus equipped enters this institution and pharmacy at great personal disadvantage; it is simply the dictate of candor and truthfulness to tell him so, and advise further preparation. It is to determine the possession of these qualifications that preliminary examination will be instituted—*before* the student is admitted to collegiate courses,—to require this *after* his entrance, presuming that he is deficient, is to embarrass his progress, dispirit and discourage him, and to involve him in a mental effort for which he is wholly unprepared. With all the unfavorable conditions apparent, he is yet received here, and entered upon a theoretical and technical course. With an ambition worthy, perhaps, of more consideration, without reference to his inability to retain and comprehend he has to keep pace with his better favored associates in the end only to be relegated back, rejected, mortified, and disgraced. How much more just and generous to intercept his entrance, point out his palpable deficiencies, and advise a better course of preliminary preparation! Without further remark on this, it will be evident, we think, to any one that reflects that “no consideration as to confronting the candidate with an apparent difficulty should be allowed to weigh against imposing a set of conditions framed with the sole object of bringing him to the examination room more thoroughly equipped for the ordeal itself, and for the creditable fulfillment of the duties of his life work.”

In September of the year 1870, a Pharmaceutical Educational Conference was held in Baltimore, at which all the then existing colleges were represented. A resolution was offered by Mr. A. B. Taylor, of this purport: “That there be an educational standard established, the evidence of which shall be given *previous* to the admission of any student to attendance on the lectures of the Colleges of Pharmacy;” with a modification which did not change the spirit of the resolution, this was adopted.¹ We quote simply to show the existing state of opinion at that time on this subject.

¹ Whether the spirit was changed or not is best learned from the resolution which, as offered by Prof. Procter and adopted, is as follows (*italics* our own):

Resolved, That in the opinion of this Convention, more attention to the preliminary education of those who propose to enter the business of *pharmacutists* is needed, and it is earnestly recommended to the Colleges and Societies of Pharmacy to urge their members and the profession of the United States generally to give greater care to this subject in *taking apprentices*.

The complaint expressed in this resolution was not of recent date; for at the Con-

President J. Faris Moore, of the American Pharmaceutical Association, at the session held in Cincinnati, September, 1864, in his annual address, holds the following language: "We often find young men, thoroughly apt in their manipulations, and possessing more than ordinary talent in other respects, most woefully deficient in their general education, and this is, in many cases, a drawback of no small importance to themselves, the profession, and the community at large. I should think means could be easily devised by which the standard of necessary education might be raised to such a height as would be both beneficial and acceptable to all, and especially contributory to the dignity of the profession, pharmacy being, in the highest and most exalted acceptance of the word, 'a science.' "

An eminent and honored pharmaceutical teacher of this College, the late Professor Parrish, a man of extended experience and observation, based upon unusual opportunities of comparing students of medicine, many of whom had the advantage of academic study, with students of pharmacy whose preliminary education as a rule had been cut short, states as his conviction that what is "most needed in pharmacy is a higher grade of preliminary education." Were such references necessary, we could extract voluminously from the most authentic sources to sustain this view. "The needed element to secure successful attainment in any effort to raise the influence and standing of such a body of men as pharmacists, in their relation to the public and to medical science, is to be found in education—scholastic, technical, or scientific." There are five points or specifications which indicate clearly the purpose of preliminary examination, and the conditions which make such a method a necessity of the present time. They are as follows:

First. The imperfect mental training with which so many young men commence their so-called scientific work.

Second. The large proportion who present themselves for class teaching without any genuine intention of mastering the sciences taught.

Third. The generally prevailing intention to make as little knowledge as possible suffice to carry candidates through the examination,

vention of 1852, when the American Pharmaceutical Association was organized, a committee, consisting of Wm. Procter, Jr., S. M. Colcord and G. D. Coggeshall, reported as follows: " *Proprietors* often do not consider the fitness of applicants, both as regards natural endowments and preliminary education, with that care and attention that a due regard to such applicants demands."—EDITOR AM. JOUR. PHAR.

and the habit of regarding the passing of the examination as the chief purpose of that knowledge.

Fourth. The difficulty of properly estimating the true value of what an examinee appears to know, due in great part to complete ignorance of his previous training, and therefore doubt as to whether the answers given be a mere effort of mental retention, or the expression of an understanding that has really grasped the subject.

Fifth. The want of a legitimate relationship between pharmaceutical education and pharmaceutical examination.

So important has this subject become in the deliberations of the Board of Trustees, and so imperative seems to be the demand from the profession at large for some radical change in the methods of receiving matriculants, that, by a resolution, the subject was committed to the Permanent Committee on Instruction, who were directed to submit the question to the members of the College. This committee, pursuing the object of their instructions, addressed, in printed form, four interrogatories, as follows, requesting answer :

First. Do you favor a preliminary examination of students applying for matriculation in the Junior Class of the College?

Second. What branches of English education should be included in such examination?

Third. Should any knowledge of the Latin language be included?

Fourth. What should be the extent or limit of such examination?

The replies came in due time, and, with suggestive views on the lateral question, formed a part—an interesting part—of the committee's report. A compilation of the answers showed that the majority were decidedly in the affirmative upon the leading question, and in some cases remarks were appended giving positive favor to the adoption of some such form of preliminary examination as would not only test the educational acquirements, but the practical experience as well, of the applicant in advance of his admission.

However disproportionate the expressed sentiment of the Board of Trustees may be upon this immediate question, there is a striking unanimity of favorable opinion in the more open and extended membership of the College. The Committee on Instruction evidently felt the weight of this, for the chairman, *ungenerously*, we thought, sought to lessen its effect by alluding to those favoring the plan as a class guilty of lack of personal interest in their general duties to the College.

Upon the acceptance of the report of this committee it was further

resolved to make this subject one of special consideration and discussion at a stated meeting of the College in May next.

It will thus be seen that the preliminary plan is *not* substituted, as we think has been erroneously supposed by some, by the present tentative, but will yet come before the body of the College at the time designated for final adjustment.

One of the objections frequently urged against the adoption here of a radical reform, such as preliminary examination, is the possible result to the financial interests of the College, and grave apprehension has pictured a diminished roster, a corresponding loss of revenue, and a number of other effects which timid minds view with alarm. But what, we ask, have these considerations to do with that which is involved in correct principle? Are we to measure the value of the professional status of pharmacy by the pecuniary interests of this or any other College? What interests have this body of Trustees (with some individual exceptions) in the revenues of the institution except to meet its obligations and sustain the dignity of its various departments? all of which can be well and faithfully done by more conservative management.¹

When, some five or six years ago, the University of Pennsylvania, the oldest and most distinguished institution in the country, took the initiative, so far as its own medical school was concerned, in adopting the graded system of education, it was not without expressed fears and misgivings. The change was construed to mean a loss of students, for many men would naturally go where they could get their diploma most easily, rather than where they would have to work the hardest for it; it meant a loss of revenue, and it meant a great many things which the imagination viewed with fear. But the Trustees and the Faculty rightly felt that it would be even better for the leading medical school of the country to graduate *one* well-equipped physician than a hundred or so who had simply crammed for their final examination, and they resolved to proceed. The result has more than justified the wisdom of their resolution. The diploma of the medical school of the University of Pennsylvania *now* means something.

¹ It seems but fair to state, in this connection, that the College has always fearlessly incurred obligations, when it was necessary, for advancing the cause of pharmaceutical education, by erecting suitable buildings and providing facilities for instruction; and that the College has also recognized it as a duty to cancel these obligations as rapidly as was consistent with her best interests, thereby keeping the credit of the institution free from reproach.—EDITOR AM. JOUR. PHAR.

With such precept before us, no apprehension need be entertained that the honorable prestige of this College will suffer decline. Its standing among the similar institutions of the country has steadily advanced, as its present character and popularity amply testify. Its various scientific departments have been entrusted to able hands—the seniors of its faculty stand eminent in their profession—the College has established the most advanced and improved plan of instruction—the public appreciation has been manifested in the throngs of young men constantly eager to embrace that instruction—its methods of education are perhaps superior to any other institution of the land. All this is accorded by the profession as a merited tribute to an honored and venerated alma-mater, and from this profession has come, through many channels of influence, a generous and liberal endorsement. It is this same profession, however, which presents itself here to-day, and asks, in respectful tone, that this College, having reached a wondrous growth of prosperity—having at this time its representatives in every city, town and village of this extended land, shall, halting, interpose its offices to check a tide whose direction and current have overleaped the bounds of safety, and been strong enough in its unchecked flow to exhaust quite all the remunerative resources of pharmacy as a profession, with the result of debasing it to a trade level, without even the dignity of being distinctive in that!

We need hardly pause here to say, that this matter is grave and important. From an intimate association with my confreres of the Board of Trustees who are honored men of matured thought and sound judgment, we recognize a disposition in determining this question, to be considerate, just and fair to those upon whom the greater exactions in the future may fall, but at the same time there is resolution to perform that which their duties as guardians of a trust impose, among these a duty which now seems to be demanded by the common professional welfare of pharmacy.

It is not assumed, nor is it asserted, that this College, or other similar institutions are wholly responsible for the present status of pharmacy educational and moral, but it is contended that the educational colleges constitute an essential part in a common agency, in which whatever of responsibility exists is divided, and believing that by the adoption of a better system of discrimination in its proteges this College *can* elevate the standing of pharmacy, and relieve itself of all reproach; such course impresses itself upon the mind as a duty

demanding alike by the welfare of the body and a conscientious regard for the interests of pharmacy.

Let me ask you whether you think it an overdrawn statement, that scores of young men who having attempted pharmacy as a pursuit, without fitness, suddenly confronted with a realizing sense of the arduous task before them, diverted from any inclination to the pursuit of study by the exactions of business, placed at many, and serious disadvantages—without qualified instructors—promised a knowledge of the business, but never permitted to use the means of attaining it, should eagerly grasp at any other prospect than the tedium of shop study, should present themselves here under a pardonable delusion that this College can assume the entire charge and responsibility for their complete and perfect education, and ultimately go forth under the still worse self-delusion that they have obtained it?¹

William Procter, a man eminent and honored throughout the world wherever pharmacy is known, whose memory is revered here with profound respect, whose mind was instinctive with the best interest of pharmacy, writes editorially in the JOURNAL as follows, April, 1871: "No amount of *tuition by lectures* will be equivalent to that which the earnest student receives in the dispensing shop under the personal instruction of a well qualified pharmacist who takes an interest in his pupil;" again on the same subject, in 1871, he says, "It is not to be expected that a large proportion of students of pharmacy can get the tuition they need in college schools, and it is time that some efforts should be directed by *disinterested* (disinterested so far as any connection with the College was concerned, we presume) members of our profession towards encouraging this home effort among the present generation of apprentices and assistants;" and again in 1869, "An apothecary without shop experience is like a medical graduate without hospital or other practice. They are both of doubtful reliability."

Let us go back to the earlier history of this College, and dividing its term of existence into periods, note some significant facts. The College was incorporated in 1821—five years elapsed before any graduate went forth—taking the period from 1826 to 1869, inclusive—forty-three years—we find by the record that this College graduated 701 young men, or an average of $16\frac{1}{3}$ per year—now observe—that in

¹The College still adheres to its By-law as rigorously as it ever did, viz., that the candidate for the diploma shall "have served an apprenticeship of at least four years with a person or persons engaged in and qualified to conduct the drug business."—EDITOR AM. JOUR. PHAR.

the fifteen years following the average number has reached $99\frac{4}{5}$, almost a 100 each year. We present this statistical statement without comment, although it would be a matter of interest to connect cause and effect.¹

It must be borne thoughtfully in mind in considering this subject that with the growth of this College handsome pecuniary interests have also grown and continue to increase—interests which, if kept subservient to the ethical status of the College and of the profession, would be looked upon simply as gratifying evidence of prosperity, but which, if permitted to exercise their natural influence, are at variance with and inimical to those principles of ethics controlling professional welfare. Professor Parrish, an eminent authority, writing in 1854, see "*Am. Jour. of Pharm.*," page 215, Vol. ii, No. 3, says, "Against the establishment of numerous schools of pharmacy there lie many objections founded upon the difficulty of maintaining them, and upon the almost inevitable lowering of the standard of graduation consequent upon this kind of competition."

A conviction now well settled in the public mind and largely added to by the expressions of the public press, is that the degree granting institutions of this country have let go the old-time safeguards and entered into an era of business rivalry. That the diploma has lost a measure of its credit of value, except as a testimonial of a certain amount of zeal and industry in the pursuit of study.

By a retrospect of the history of this College we are able to ascertain something of its origin and the causes which promoted it. As original members whose connection with the College dates with the beginning, ten respected names appear, seven of whom were, we believe, classed in the directory of the day as wholesale druggists. From this and other historical information which surrounds its foundation and early history, we are led to believe that it had its conception in the fact that the assistants of the wholesale stores were deprived of that important rudimentary education of greater familiarity with drugs which the retail shops at that time so well afforded, and this disparity of opportunities resulted in throwing upon the profession a class of illy-informed men, many of whom, by drift of circumstances, ultimately found their way into retail establishments as assistants or principals and thus ignorance multiplied. In other words, the original object of

¹ There are about 28,000 proprietors of drug stores in the United States; how many of these are Graduates in Pharmacy?—EDITOR *AM. JOUR. PHAR.*

this institution was to afford a theoretical knowledge of pharmacy as a science, and to inculcate a better comprehension of its collateral branches of botany and chemistry, which latter, particularly, the too limited (at most) term of apprenticeship failed to afford.

We here assert without fear of reasonable contradiction that it never was the intent and purpose of this institution in its foundation, or subsequent course, to assert the prerogative or office of imparting *full* and *complete* instruction in a vocation which includes mechanical scope, nor to arrogate to itself any broad scheme of education which should profess to supersede that practical information which the shop only and no other means could properly supply.

It has been the expressed conviction of the most eminent men in the profession since the early history of pharmacy in this country that the art, or the rudimentary branches, without which no deep foundation of requisite knowledge can be had, could be better acquired in the work shop, implement in hand, with tutoring oversight than by any theoretical instruction away from familiar surroundings, and that the mechanical principles involved in the various operations to be performed, can only be impressed and comprehended by renewed and repeated familiarity with the processes themselves. This seemed to apply with greater force to pharmacy than to any other of the higher occupations, because its work is not only scientific but mechanical, and with manual dexterity must go a certain amount of reasoning power, and the combined working and thinking were calculated to make a deep and lasting impression upon the expanding mind, which no amount of didactic or superficial teaching could equal.

To quote too freely in illustration of what we present would be to impose too much upon your time, but we desire at this point to refer to the general remarks on this subject in the syllabus of study prepared for students by William Procter, under the auspices of the American Pharmaceutical Association, printed in the Proc. of 1858, also to the article of Edward Parrish, published in the proceedings of the American Pharmaceutical Association of 1872, "On the preliminary education of apprentices"—these two articles from the pens of honored authors, now deceased, seem like legacies left for our benefit, and will well repay perusal by those interested in this subject.¹

¹ We agree with the author that the papers alluded to should be regarded as legacies from men who were eminent as pharmacists and as teachers of pharmacy. Prof. Procter's views on the preliminary education of apprentices are given in the foot-note on page 66, those of Prof. Parrish in the paper mentioned above, which was the *last one*

A reference to the numerous articles extant, and to the public utterances of the most observant minds of earlier pharmacy, indicate one general view of this subject, and this view, that the shop tuition and practice was the one vital principle underlying all true foundation of pharmaceutical knowledge, and that, without this, no apprentice to pharmacy could be prepared for the higher attainments in scientific knowledge, that this training should preferably precede, or be coincident with collegiate courses, and that the two should be so fitted and adapted as to secure the best results to the student.

If we turn a look of inquiry into the existing condition of pharmacy of this country, and compare it with that of twenty years since, we will observe a marked decline; its *morale* is not what it then was, its *personnel* has undergone most distinctive change, and that essential *esprit du corps* which should characterize a body of scientific men is totally lacking. The value and usefulness of its offices are still recognized, but its representatives fail to command that public respect and confidence accorded to those of former years. Instead of the merchandizing features of the business being auxilliary to the scientific art, the latter is only an appendage to the former, and if the mere insignia of the occupation be taken away there would be scarcely features enough left to recognize pharmacy. A groundling and mercenary spirit has absorbed the ethical sentiment, and pharmacy seems to be threatened with disintegration. If asked to trace these results to a cause, we should ascribe them to an occupation vastly over-crowded. An occupation no longer remunerative as a distinct vocation, it has become naturally subservient to the arts of trade, as evidenced by the inroads of manufacturers, the adoption of nostrums and quackery, the piracies of commerce. That a spirit of rivalry in the collegiate institutions has had much to do with augmenting the ranks of pharmacy, we think none will deny. The temptation has been great to open wide doors to the clamoring throngs seeking admission to educational methods, which promise a comparatively quick and easy accomplishment of a work, the work of a life otherwise tedious and difficult!

The statistics of the census show a ratio of one apothecary to every

written by him on a pharmaceutical subject a few months before his death; the paper concludes with the following earnest advice (Italics our own): "Let our Colleges then be *kept open to all*, let their instructions be popularized and made as comprehensive as possible, and while we seek gradually to raise the standard of graduation, let us *not choke the entrance to the schools* by restrictions calculated to exclude those *who most need their instructions*."—EDITOR AM. JOUR. PHAR.

1,500 of population in the city of Philadelphia; in the country at large the proportion is as one to 1,800.

There has been a steady growth of business rivalry in the more prominent pharmaceutical institutions of this country; some have wisely withdrawn from all competitive effort, and such course has been received with approval. The future work and standing of these institutions will give ample evidence of a wise foresight.

The University of Michigan was the first institution in this country, we believe, to take the long, bold stride of graduating pharmacists without any requirement of preliminary educational or shop training. The action of the Michigan University was not without remonstrance, but this was answered with the ingenious plea that the College was not engaged in making mere ready tradesmen in pharmacy, but of preparing men for higher and more responsible positions, educating scientific experts, drug assayers, toxicologists, men habituated to accuracy, etc.; presuming such to have been a *bona-fide* intention, would the country find a need of so many men to fill positions only casually made necessary? No; and we believe the view was firmly maintained that it was an unsafe departure from time-honored precedent, and could end only in degeneracy and demoralization, but it marked, as we have said, a step in the methods of rivalry.

If time permits, suppose we look a little farther, and compare pharmacy in its status or standing with its associate profession, medicine. Here are two professions, whose offices, both liberal and humane, whose educational requirements include the same general scope of study, yet differ so widely, in the public respect, deference and appreciation. We believe not as a pharmacist, but as an honest conviction, that a thorough pharmacist requires a better education than his medical brother, and yet medicine takes higher social rank than pharmacy; yea, higher scientific rank. That this should be the case must be explained by the fact that the votary of medicine, deservedly, has the credit of being the better equipped of the two in educational advantages. And there are many who hold to the opinion that pharmacy will never take equal rank *with* medicine until it includes in its *personnel* a more considerable proportion of well educated and cultured men.

Pharmacy it must be borne in mind draws its recruits from the great middle classes, including the better educated laboring element, who seeking more remunerative occupations for their wards, and being

yet too limited in means to bestow a liberal education, the sons must be at labor at an early age for self-sustenance, thus trenching, through necessity, upon those precious years of tutelage, and finally launching them into some pursuit (it may be pharmacy) for which they are in no manner qualified.

Does the literature of the pharmaceutical profession of this country give any evidence of the value of its scientific education? We think not; there is an apparent absence of effort, and no especially important contributions emanate from American authors, in the line of valuable research and discovery, a fact of significance to those prone to boast of improved methods and enlarged opportunities.¹ Take the higher type of our own periodicals, take our own offspring, the "*American Journal of Pharmacy*," and from what source does it derive its best material? Most certainly from the close and thorough students of that grand old Empire, Germany, comes an everflowing flood of light and knowledge; "an empire upon whose educational system (pharmacy included) all others, with some modifications, are formed; an empire which has for generations been rearing up a complete system of education for all classes, which whilst it lays foundation broad and deep in general culture, directs at the same time mental research into the channels of art and science, and fosters this with a wisely guiding and directing hand."

The present condition of pharmacy in England and America are somewhat similar; the same determining causes exist there as here, with the same general result. Complaint loud and persistent has awakened our transatlantic brethren to a realizing sense of a profession imperilled, and they have instituted as prerequisites to pharmacy, individual capacity, educational fitness, preliminary training, and are seeking parliamentary enactment to protect the commercial features of the business.

If we take a view of pharmacy of Continental Europe, we find a wholly different condition prevailing, a high educational requisite prescribed by law, in some countries a governmental supervision and control, territorial limitation to business, legal sanction and license, each and every one of which exactions aims to secure, and it unquestionably

¹ We are not disposed to overrate the importance of contributions to pharmaceutical knowledge from American authors; yet it is but proper to state that such papers receive due attention on the other side of the Atlantic, and are, as a rule, regarded as possessing practical—if not scientific—value.—EDITOR AM. JOUR. PHAR.

does secure, for the profession, its highest possible attainment, dignity and usefulness.

The question of pharmaceutical education assumed great prominence at the meeting of the International Pharmaceutical Congress, held in London, August, 1881. The various representatives of pharmacy, in reply to interrogatories, gave statements of the legal and professional status of pharmacy in France, Italy, Sweden, Denmark, Belgium, Holland, Austria and Hungary. In all of these countries the Government controls pharmacy. The standard of education is prescribed and rigidly determined, and there are special laws bearing upon the relation of pharmacy to the State and to the public. Such restriction would be obnoxious, and difficult of imposition in a country like this, but the main point which is essential to our purpose here is to show the universally admitted importance of the first progressive step, preparatory education.¹

The code of ethics of this College—the moral law, upon which all provisional should be based, in paragraph 9, on the subject of apprentices in their relation to this Institution, reads thus: "It is recommended that those applicants who have had the advantage of a good preliminary education, including the Latin language, should be preferred" in the selection.² A law of essential importance, yet heretofore openly disregarded by non-compliance, ever since the time, perhaps, when oral examinations were discontinued, a method *immensely* superior to that now adopted, for through it examiner and examinee were brought into close personal relation, and the former had many opportunities of ascertaining the proficiency of his pupil in general culture by conversational tests, opportunities which are now wholly shut out. A student in the processes of examination, as subsequently conducted, may be profoundly ignorant of all else; his chirography may be bad, his etymology even worse, yet an acute mental retention, in a certain line of instruction, may save him from failure.

It has been stated that this College would have no legal right to bar out candidates. The preamble to the charter refutes such idea, in the

¹This preparatory education is required in the countries named, as it is in England, before the young man can become an apprentice in pharmacy.—EDITOR AM. JOUR. PHAR.

²The quotation refers to the selection of apprentices by employers and members of the College; the subject of preliminary examination before entering the College is not alluded to, directly or indirectly, in the code of ethics, charter, constitution or by-laws.—EDITOR AM. JOUR. PHAR.

language which says: "to dispense and prepare drugs and medicines requires knowledge and skill of a peculiar kind," "it is the duty of good government to protect its citizens from ills and dangers," "instituted (the College) for the purpose of cultivating, improving and making known a knowledge of pharmacy and its collateral branches of science."

In the application of these remarks, in so far as they may apply to all interested, no spirit of unkindness exists; nor tendency to deter the earnest and thoughtful student from the pursuit of a study congenial to his tastes and inclination. Pharmacy *wants* cultured and educated men, *needs* them urgently to raise up the status of a dignified and worthy profession; but she wants none to venture under a self-imposed conviction that the path to her portals, and through her broad fields of science is smooth, straight and easy of pursuit. This College is eager to extend to all fitted aspirants a helping hand, and extending to these her offices, share in the pride of their success and future eminence. The range of studies required to fit the man has become so wide that a great part of his preparation *must* be accomplished before the College assumes the guardianship of his further progress; if deferred until afterwards, the deficiency will *never* be made up. The Philadelphia College of Pharmacy is not willing longer to assume the risks of the past. A sound elementary and rudimentary instruction *before* collegiate courses will make the students' instruction here a matter of far more easy comprehension, and when the final test comes he falls back upon a well-grounded structure of preliminary knowledge, with a self-dependent feeling of confidence greatly to his credit and advantage. This College, like a parent, feels the greater pride in her brightest children, but nevertheless with true parental instinct she *loves* them all.

PHILADELPHIA, January 20, 1885.

USE OF COCAINE.—Dr. Jelinek obtained temporary relief in a case of painful deglutition by applying to the back part of the mouth a ten per cent. solution of cocaine (*Wiener Med. Woch. Schr.*) Dr. Murrell has used cocaine hydrochlorate in neuralgia, relief being afforded by hypodermic injection; but he prefers a 20 per cent. solution of the salt in oil of cloves, of which from 5 to 10 minims are rubbed in with the finger.—*Brit. Med. Jour.*

SPIRITUS AMMONIÆ AROMATICUS.

BY ANDREW BLAIR.

Read at the Pharmaceutical Meeting, January 20, 1885.

It is a very important matter that all preparations, especially of a medicinal nature, should be, as far as it is possible to make them, permanent in appearance, taste, smell and activity. About a year ago, the attention of the writer was called to a lot of aromatic spirit of ammonia, of which complaint had been made on account of its deep red or brown color. This was very marked, and so much so as to induce an examination of the cause.

If we look at the Pharmacopœia of 1870, we find the following formula:

R	Carbonate of ammonium.....	3i
	Water of ammonia.....	f 3iii
	Oil of lemon.....	f 3iiss
	Oil of nutmeg.....	℥xl
	Oil of lavender.....	℥xv
	Alcohol.....	Oiss
	Water, q. s. ft.....	Oii

This preparation has been satisfactory, and no occasion to modify, improve or alter it has ever existed, that the writer is aware of. It is permanent in its color to a marked degree, the change in 18 months being so slight it is hardly worth noticing. (See sample No. 1.)

Let us now look at the formula in the Pharmacopœia of 1880, and we find it contains:

R	Carbonate of ammonium.....	40 parts.
	Water of ammonia.....	100 "
	Oil of lemon	12 "
	Oil of lavender.....	1 "
	Oil of pimenta.....	1 "
	Alcohol, recently distilled and kept in glass vessels.....	700 "
	Distilled water, q. s. ft.....	1,000 "

(See sample No. 2, which changed to its present color about a month after it was made.)

In the main it is like the formula of 1870, the only difference being in one of the flavoring constituents. Investigation determined that this trifling change was the cause of the trouble. Why such an alteration to a formula that has been satisfactory for 10 years or more it is

hard to understand, unless the idea prevails that with each new issue of our official book of formulas some changes "must" be made, or the revisers will be accused of neglecting their duty.

A condition of the formula of the Pharmacopœia of 1880, which the writer did not regard in making these samples, is the use of "recently distilled" alcohol. How many pharmacists have "recently distilled" alcohol, or would be able to procure it when making aromatic spirit of ammonia; or who would take the trouble to make it when needed for such preparation? This is one of the many absurd hindrances put in the way of pharmacists by the revisers of the last Pharmacopœia, to discourage and in some instances absolutely prevent them making their own preparations, except at very great cost, and by unnecessarily complicated and tedious processes, thereby encouraging them to buy the ready-made goods provided by the host of wholesale druggists who supply all and everything ready made that the Pharmacopœia contains. The simplest preparations, such as paregoric, Huxham's tincture, and such like, are now supplied by the gallon, and at prices in some cases, forced by close competition, that, counting the cost of "good" ingredients, would leave no margin or profit for the maker.

The causes of or advantages derived from the change in the preparation under consideration is wrapped in mystery, as far as the writer's knowledge goes. Such changes are an injury rather than a benefit.

To conform as much as possible to the official formula, the writer has been in the habit of using that ordered in the Pharmacopœia of 1880, using oil of nutmeg instead of oil of allspice, and disregarding the order to use "recently distilled" alcohol. The formula reads thus:

Carbonate of ammonium.....	40 parts
Water of ammonia.....	100 "
Oil of lemon.....	12 "
Oil of lavender flowers.....	1 "
Oil of nutmeg.....	1 "
Alcohol.....	700 "
Distilled water, q. s. ft.....	1,000 "

and you have the result in sample No. 3, which has now been made over a year. It has been and is satisfactory in every way, and needs no improvement.

For sake of comparison, there are here samples made within the past 24 hours according to the Pharmacopœias of 1870 and 1880.

PROXIMATE ANALYSIS OF THE BARK OF FOUQUIERIA SPLENDENS.

BY HELEN C. DE S. ABBOTT.¹

In the published proceedings of the Mexican Boundary Survey of 1859, conducted by General William H. Emory, are found numerous references to *Fouquieria splendens*. No region of equal extent presents more marked illustrations of the relations of the vegetation of a country to its topography and geology than that lying along the Mexican boundary line. The traveler traversing the desert table-lands will not fail to unite in his recollections of these tracts the dull foliage of the creosote bush, the palm-like *Yucca*, and the long thorny wands of the *Fouquieria splendens*. The vegetation of the El Paso basin and the Upper Rio Grande valley is described as strikingly different from that of the immediately adjoining country; new and strange plants are seen on every side. Upon the table-lands many plants grow not to be found in the more fertile valleys; among these is *Fouquieria*, a tree locally known by its Mexican name *ocotilla*. A full description of the appearance of the plant is given in the Mexican Boundary Survey; also one in an article by Edward Lee Green.² The author describes *Fouquieria splendens* in these terms: "It is a splendid oddity and not more odd than beautiful, flourishing in great abundance in many places. It grows to the height of from eight to twelve feet, and in outline is quite precisely fan-shaped. The proper trunk, usually ten to twelve inches in diameter, is not more than a foot and a half high. A few inches above the surface of the sands this trunk abruptly separates into a dozen or more distinct and almost branchless stems. These simple stems rising to the height of eight or ten feet gradually diverge from one another, giving to the whole shrub the outline of a spread fan. Each separate stem is clothed throughout with short gray thorns and small dark green leaves, and terminates in a spike, a foot long, of bright scarlet trumpet-shaped flowers. The stems are not so thickly armed with thorns, but that they can be handled if grasped circumspectly, and being very hard and durable, as well as of a convenient size, they are much employed for fencing purposes about the stage

¹ Paper read before the Chemical Section of the American Association for the Advancement of Science, at Philadelphia, 1884, by H. C. De S. Abbott.

² Botanizing on the Colorado Desert, "American Naturalist," 1880.

stations and upon the ranches adjoining the desert." The author states: "Give a skillful Mexican ocotilla poles and plenty of raw hide thongs and he requires neither nail nor hammer to construct a line of fence, which for combined strength, neatness and durability fairly rivals the best work of that kind done in our land of saw-mills and nail factories."

The plant is botanically described under the order *Tamariscineæ*, tribe III, *Fouquieriaceæ*, new genus and species.¹ For other sources of information see "A Tour in New Mexico,"² and in "Plantæ Wrightianæ Texano-Mexicanæ."³ The writer has not been able to find any notice of chemical studies made upon it.

The specimens of ocotilla, at the writer's request, were collected and transmitted from Lake valley, Southwest New Mexico, through the kindness of Professor E. D. Cope. The portions of the stem, similar to those used in the analysis, vary in diameter from an inch to an inch and a half. The bark shows a thickness of over an eighth of an inch, and is of a sage color generally. The exterior surface is made rough by an interlacement of hard projecting material; some of the smaller stems are encircled with the gray thorns described, arising in regular series from the projecting portions of the bark. Between the interlacements are oblong and diamond-shaped intervals, which are filled with superimposed layers of a yellowish color and looking as if coated with a wax. They appear to be cemented together by a glistening substance which on warming the bark exudes and possesses a resinous or gum-like consistency.

In the present investigation, the scheme proposed by Dragendorff⁴ has been followed out, with the exception of the maceration at the ordinary temperature; an apparatus similar to the one devised by Tollens⁵ has been used for the extractions. The air dried material reduced to a very fine powder was again dried at 100° C. giving 9.4 per cent. moisture. The great importance of powdering the material for the various estimations as insisted upon by Dragendorff⁶ was fully confirmed in these examinations. Quantitative determinations with

¹ Bentham and Hooker. Genera Plantarum.

² By Dr. N. Wislizenus.

³ Gray, Smithsonian Contributions to Knowledge. Vol. iii, Part i, p. 85 and Pt. ii, p. 63.

⁴ Plant Analysis, Qualitative and Quantitative. G. Dragendorff, Ph.D. Translated from the German by H. G. Greenish. London, 1884.

⁵ "Zeitschrift f. anal. Chemie," xiv, 82, 1875, and xvii, 320, 1878.

⁶ Loc cit.

ocotilla bark reduced to fine pieces gave 2 per cent. and 3.5 per cent. less than the percentage obtained from the estimations with the powdered substance. Determination of total ash gave 10.26 per cent.; a qualitative ash analysis showed the presence of calcium, magnesium, aluminum, potassium, sodium and a trace of iron, sulphates, phosphates and chlorides.

Ten grammes of the air-dried powder treated with petroleum spirit of boiling point 46° C. extracted a substance without aromatic odor, communicating to the liquid a light color. From 100° C.C. a measured portion was evaporated for determination of total amount of substances brought into solution. The residue dried at 100° C. gave 9 per cent., at 110° C. 8.87 per cent., at 120° C. 8.875 per cent. and a loss of .125 per cent. showing scarcely appreciable trace of volatile oil. The remainder of the petroleum spirit extract on evaporation at the ordinary temperature left a solid yellowish-green wax substance of specific gravity .984, melting from 84° C. to 85° C., insoluble in water, slowly soluble in boiling 95 per cent. alcohol, readily in absolute alcohol, in cold ether, chloroform, amyl alcohol, benzol, carbon disulphide, oil of turpentine and linseed oil; slightly dissolved in aqueous alkalies, but not saponifying with them. It is colored yellow by nitric acid, acted upon by concentrated sulphuric acid, and not by hydrochloric acid nor aqua regia. By means of combining sulphuric acid and solvents, I was able to obtain several color reactions that may prove upon further investigation of value in identification of the different vegetable waxes. With Japanese wax, the only specimen of vegetable wax, I could obtain, the color reactions differed in each test from the substance under consideration. The following color reactions were obtained with the petroleum spirit residue. When small fragments were stirred on a watch crystal with two or three drops of concentrated sulphuric acid of 1.84 sp. gr. the substance at once changed color to a clear garnet red and was slowly dissolved by the acid, the liquid remaining colored; with different portions of the red acid liquid stirred on a watch crystal with various solvents used in excess, it was noted as follows: With absolute alcohol the color was instantly dissipated leaving a white precipitate; petroleum spirit discolored the acid solution, leaving no precipitate; ether discolored with gray precipitate; chloroform changed the red acid liquid to yellow, no precipitate; with benzol the red color was changed to snuff-brown gradually passing to red-brown; amyl alcohol gave a rose-pink and slowly passing through varying

tints to a fine purple. So called pure amyl alcohol was used and when tested did not give a color reaction alone with sulphuric acid. The petroleum spirit residue on boiling with absolute alcohol and when warm, thrown into several times its volume of cold water separated out as a white cloud.

Employing a method by which melissyl alcohol has been obtained from Carnaüba wax,¹ the petroleum spirit residue was submitted to a like treatment. It was boiled with alcoholic potash and saponified, the alcohol distilled off and lead acetate added; a heavy light-yellow colored precipitate formed, and on boiling yellow masses separated out. They were washed, dried, and boiled with absolute ether. The filtered liquid on cooling deposited a yellow crystalline substance, which on heating on platinum foil turned black and disappeared. Beyond ascertaining the fusing point, solubilities, and color reactions, the substance was not further examined. It was found to fuse between 43° C. and 60° C., the greatest change occurring between 57° C. and 60° C.; to be soluble in chloroform and ether; scarcely soluble in cold absolute alcohol; very slightly soluble in boiling 95 per cent. alcohol; not acted upon by nitric acid nor aqua regia. Sulphuric acid dissolved the substance and gave an orange color reaction discolored on adding alcohol, ether, chloroform and ammonia to the acid liquid, with no precipitate; with amyl alcohol a pale rose pink quickly fading, and with benzol a brown color, were obtained. The color tests differed from those obtained with the substance before saponification and treating with boiling ether, indicating that the petroleum spirit residue can be separated into at least two substances and possibly more, which remain to be determined by a future study.

The powder exhausted by petroleum spirit, was dried and similarly treated with absolute ether as in the previous extraction. The ethereal extract of a greenish color gave an acid reaction with litmus, and on addition of alcohol the liquid became turbid. Spectroscopic examination failed to detect the characteristic chlorophyll bands. The ethereal residue on evaporation presented differences in color and solidity from the petroleum spirit residue. It was quite brittle, and was not appreciably softened at 120° C. It gave when dried at 100° C. 4.52 per cent. solids extracted, at 110° C. 4.44 per cent. and at 120° C. 4.42 per cent. The residue when evaporated at ordinary temperature was

¹ Liebig, Annalen, 183, p. 344; Watts Dict. Chem.

insoluble in petroleum spirit, slightly soluble in 95 per cent. alcohol and carbon disulphide, quite soluble in cold absolute alcohol, amyl alcohol, chloroform, benzol and oil of turpentine. Nitric acid gave no reaction. With sulphuric acid and small portions of the ethereal residue, I obtained a dark mahogany color. This solution on adding absolute alcohol was partially discolored, no precipitate. With ether the sulphuric acid solution gave a greenish precipitate, with amyl alcohol the acid solution was discolored changing to pale red, then green. These tests show in each case a wide difference in color reactions from those obtained with the petroleum spirit residue. The amount of solids taken up on treating the ethereal residue with water was .36 per. cent. The aqueous liquid was neutral to litmus, portions tested for alkaloids gave negative results; on warming and addition of dilute sulphuric acid, Fehling's solution was reduced, indicating possibly glucosides. The portion insoluble in water was then treated with absolute alcohol. The liquid gave an acid reaction with test paper. A measured part of the liquid was evaporated and the weighed residue showed 1.6 per cent. of solids dissolved. The residue from the evaporated alcoholic liquid was partially dissolved by aqueous alkalies. It readily saponified with alcoholic soda, forming a soft brown soap, which on boiling with lead acetate yielded a yellow precipitate. This was collected on a filter and washed. When the precipitate was boiled with absolute ether and the filtrate allowed to slowly evaporate, a white organic crystalline substance separated out. Under the microscope particles of coloring matter were found to be interspersed among the crystalline structures.

The indications would show an acid resin to have been extracted by the ether.

The ten grammes of powdered bark, after exhaustion with petroleum spirit followed by absolute ether, were treated with absolute alcohol. A measured quantity of the alcoholic extract was evaporated in a weighed platinum dish, dried until weight noted was constant. After incineration the amount of ash was found to be .15 per cent. of the original material. The alcoholic extract for determination of total amount of organic solids dissolved, was evaporated in a current of carbonic acid, when the residue dried gave 8.6 per cent, and 7.98 per cent. of solids respectively. A cloudiness formed on the addition of water to the residue, which cleared up on addition of alkalies. It was restored by acid. The aqueous liquid gave precipitates with calcium

and lead salts. It reduced Fehling's solution on adding dilute acid and warming. Negative results followed tests for alkaloids. Treating with two volumes of absolute alcohol, according to Dragendorff for detection of gum, vegetable mucilage was separated. Tests failed to detect the presence of tannin.

The residue of the powdered bark, after exhaustion with absolute alcohol, was treated with cold water. A deep red mucilaginous liquid which became frothy on shaking, was extracted. The amount of solids in this solution, on evaporating the liquid and weighing the residue was found to be 19.11 per cent.; in absence of acid or boiling glucose was identified by Fehling's solution, also by Mulder's test. A gum separated by absolute alcohol and quantitatively estimated, showed 4.8 per cent. of the amount of substances dissolved in water. The powdered residue, after treatment with water, was macerated with dilute acid, and gave negative tests for alkaloids. The extraction with caustic soda for identification of albuminous substances, followed by chlorine water for the estimation of lignin and cellulose, have not yet been determined.

The results of the proximate analysis, as so far completed, may be stated as follows:

Moisture.....	9.4
Petroleum spirit residue.....	9.
Ethereal residue.....	4.52
Alcoholic residue.....	8.6
Water residue.....	19.11
Total ash.....	10.26
Alcoholic extract ash.....	00.15
	<hr/>
	61.04

The difference of 38.96 per cent. would include pectose, coloring matter and cellulose or woody fibre.

Petroleum spirit extracted a solid substance, yellowish green in color of sp. gravity .984, melting from 84° C. to 85° C., insoluble in water slightly soluble in boiling 95 per cent. alcohol, soluble in absolute alcohol, cold ether, chloroform, amyl alcohol, benzol, carbon disulphide, oil of turpentine and linseed oil. It was slightly acted upon by aqueous alkalis; but readily saponified with alcoholic soda. Treating the soap with lead acetate and boiling the precipitate with ether, a yellow crystalline substance was obtained, melting from 43° C. to 60° C. Sulphuric acid combined with solvents gave characteristic

and distinct reactions with the yellowish-green petroleum spirit residue, and with the crystalline substance separated from it.

A scheme has been proposed for the identification of various waxes based upon quantitative experiments.¹ The examination rendered division into two groups possible, according to the solubilities of the waxes with chloroform. Again their action with ether, and acetate of lead solution added to the alcoholic solutions, allow the several varieties of waxes to be distinguished from each other.

The petroleum spirit residue was submitted to the tests proposed in Hirschsohn's scheme. It was boiled with ten times its volume of chloroform and when cool the liquid became cloudy. By this test the petroleum spirit residue was placed in the group with Carnaüba and Bahia wax. An ethereal solution of the petroleum spirit residue, on adding an equal volume of alcohol, remained clear. According to Hirschsohn's Scheme,² an ethereal solution of Bahia wax similarly treated remains clear, and by this means the wax is distinguished from Carnaüba wax, which it is said to resemble in most of its properties. The wax from *Copernicia cerifera*, the Carnaüba tree of Brazil, and Carnaüba wax obtained from the leaves of *Corypha cerifera*, are related very closely by their chemical properties and possibly are identical.³

Carnaüba wax is described as a clear yellow wax with a greenish tinge, and harder than bees' wax. It contains a notable percentage of free melissyl alcohol and other alcohols very difficult to separate. Insoluble in water, it is dissolved with difficulty by alcohol and ether, though readily soluble in carbon disulphide and oil of turpentine. It is not acted upon by linseed oil; it is changed yellow by nitric acid; with sulphuric acid no appreciable effect. The melting point is variously stated from 82° C. to 85° C. The specific gravity from .998 to .999.

A table of the specific gravity of the different kinds of waxes prepared by Dietrich⁴ shows the density of animal wax to be notably low compared with vegetable waxes. Allen⁵ states that the presence of

¹ Contributions to the Chemistry of several varieties of wax, by E. Hirschsohn, Pharmaceutical Journal and Transactions, vol. x, March, 1880.

² Loc. cit.

³ Gmelin. Handbook of Chemistry, vol. xviii. Translated by H. Watts, London.

⁴ E. Dietrich. Specific Gravity of Wax. Journal of Chemical Society, 1882, vol., xlii, p. 1189.

⁵ A. H. Allen. Commercial Organic Analysis. (Also see in same work tables of sp. gr. waxes.)

vegetable wax in adulterations of bees' wax is positively established if the density of the sample exceed .970.

By the method followed out in this analysis, petroleum spirit extracted from the powdered bark a substance of constant melting point which is identified as a wax. It resembles, in its ethereal solution not clouding on addition of alcohol, Bahia wax; in melting point and specific gravity, Carnaüba wax, also the latter wax by its insolubility in water and action with nitric acid. It differs from Carnaüba wax in its greater degree of solubility in absolute alcohol, ether and aqueous alkalis. Linseed oil is an active solvent for it, but does not dissolve Carnaüba wax. The color reaction of the petroleum with sulphuric acid have been described above. It is stated that sulphuric acid produces no effect with Carnaüba wax.¹

The wax obtained from the bark of *Fouquieria splendens* differs generally in its properties from known vegetable waxes, and is evidently a new wax, peculiar to this plant. I propose that it be called *Ocotilla wax*.

In the ether, absolute alcohol, and water extracts, the presence of an acid resin, a white crystalline substance, gum resin, glucose, possibly glucosides, gum, and a red coloring matter were indicated.

The investigations described in the preceding pages were conducted in the Chemical Laboratory of the Philadelphia College of Pharmacy, August and September, 1884.

THALLINE is said to have been used successfully in a large number of cases in the clinic of Professor Nothnagel, and has the constitution of a secondary chinoline base, being one of a number of chinoline derivatives prepared by Professor Skraup, and is represented by the systematic name "tetrahydro-parachinanisol." The salts of this base, which have an acid reaction, are all freely soluble in water, and have the property of forming green compounds when treated with solution of ferric chloride and oxidizing agents. On account of this peculiarity, the cumbersome systematic name has been dropped in favor of the shorter designation "thalline" (θαλλίς). The hydrochlorate, sulphate and tartrate of thalline and the hydrochlorate of ethylthalline are the salts that have been used, and these are said to show great antipyretic activity in doses of quarter, half and three quarters of a gramme, a point in which thalline would seem to compare favorably with some of its competitors. The lowering of the temperature is said to take place gradually and to last a considerable time, whilst it is not accompanied by any secondary disturbances. Thalline can be conveniently administered in wafers containing a quarter or half of a gramme of the sulphate.—*Phar. Jour. and Trans.*, November 29, 1884; *Phar. Post*.

¹ A. B. Prescott. Outlines of Proximate Organic Analysis.

SOME NATIVE SOUTHERN REMEDIES.

BY H. H. RUSBY, M.D., Detroit, Michigan.

The following information is taken from the author's paper, based upon a report and collection of plants sent him by Dr. E. W. Lane, Scarboro, Ga.

NATURAL ORDER SARRACENIACEÆ.

1. *Sarracenia variolaris*, Mx., Spotted Trumpetleaf, Spotted Pitcher Plant, Spotted Side-saddle Flower, or Small-pox Plant, reported under the additional name of the "Hood-topped Fly-catcher." The last name possesses interest as being the first reference in the common names to a peculiarity of this and other species of the genus, which has lately been the subject of special scientific investigation, namely, their carnivorous habits. A narrow line of sugary secretion is deposited on the outside of the pitcher-shaped leaves, running from near the ground up to the edge of, and a little way down into, the cup. Insects ascending and feeding from this viscid line, become intoxicated by the time they have reached the interior, and fall into the fluid contained within the leaf. This fluid contains a substance closely akin to the gastric juice, by means of which certain portions of the insects' bodies are digested. This proteid matter is then absorbed. The only medical virtue heretofore attributed to this genus is that of a small-pox specific, which, as pointed out by Dr. Lyons, is probably on the "absurd theory of signatures." But Dr. Lane describes it as tonic and slightly anodyne, and of use in dysenteries. These properties would seem to accord well with the physiological habits above given. A secreted substance capable of intoxicating insects would be likely to give it "slightly anodyne properties," and its digestive principle would be likely to render it tonic. As to its use in dysenteries, its abundant astringency would render it serviceable in diarrhœas which often assume a dysenteric type, but scarcely in a real dysentery. The same remarks are applicable to the next and other species of *Sarracenia*.

2. *Sarracenia flava*, L., the Yellow-flowered Pitcher-plant, etc., now reported as the "Umbrella-topped Fly-catcher."

NATURAL ORDER CALYCANTHACEÆ.

3. *Calycanthus levigatus*, Willd. Sweet-scented Shrub. Reported as "Southern Peruvian;" the bark said to have done good service as a tonic and anti-periodic.

NATURAL ORDER LEGUMINOSÆ.

4. *Phaseolus diversifolius*, Pers. Wild Bean. Reported under the name of "King Cure-all." It grows in sand, from an immense, stout club-shaped root, which abounds in starch. It is reported as beneficial to dyspeptics, the root being chewed and the saliva swallowed. The doctor judges the benefit to be derived from the increased amount of saliva swallowed.

NATURAL ORDER RUBIACEÆ.

5. *Galium pilosum*, Ait., var. Hairy Bed-straw. Reported as "Snake-bite-weed" and "Flux-weed," and the absurd name "Four-corners-of-the-earth," which last it has probably received in allusion to its four-angled stem. It is one of the innumerable weeds, of which every village has one or more, said to be a specific for the bite of the rattlesnake and other venomous creatures, and without much doubt worthless in this respect. Belonging to a family which yields the cinchonas and other powerful stimulants, and being so near to the *Galium aparine*, L., it very possibly has medicinal properties; but the objection to the property here proposed rests on our knowledge of the nature of the rattlesnake's venom.

NATURAL ORDER COMPOSITÆ.

6. *Eupatorium feniculaceum*, Willd., the Fennel-like Boneset. Reported as the "White-flowered Dog-fennel" (but the true Dog-fennel is *Anthemis Cotula*, L.). Dr. Lane testifies to it as a strong diuretic and one used with success for both man and beast. One pint of the strong decoction is an effectual drench for horses afflicted with "what is commonly called gravel."

7. *Eupatorium perfoliatum*, L. Boneset or Thorough-wort.

8. *Eupatorium rotundifolium*, L. Reported under the name of "Wild Horehound."

9. *Eupatorium aromaticum*, L. Reported as "Upland Wild Horehound." The report on the three last confirms the well-known properties of these plants. It is a noteworthy fact that *E. feniculaceum* should possess such marked diuretic power, while its congeners are nearly or quite deficient in that respect.

10. *Sericocarpus tortifolius*, Nees. One of the White-topped Asters. Reported as "Edgeweed," and said to be useful for colic in horses.

11. *Solidago odora*, Ait., the Odorous Golden-Rod. Used as a styptic; in the case of wounds, by applying the bruised plant; in the case of epistaxis, by snuffing up the powdered dried leaves. It may be

noted here that attention has recently been called to the fact that in certain parts of the country an infusion of the leaves of this plant is very generally used as a beverage, as a substitute for tea, a regular trade in the article having sprung up in the shops.

12. *Chrysopsis graminifolia*, Nutt., the Grass-leaved Silver Aster. Reported as "Blue-grass" and "Fever-grass." Used as a poultice to sprains.

13. *Helenium nudiflorum*, Nutt., the Naked-flowered Sneeze-weed. Report refers to its well-known irritating properties when applied to the nostrils.

14. *Gnaphalium purpureum*, L., the Purple-flowered Everlasting. Reported as "Cough-weed," and as a remedy for coughs and colds.

15. *Gnaphalium polycephalum*, Mx., the Sweet-scented Life-everlasting. Reported as a diaphoretic and a poultice in tympanitis.

16. *Pterocaulon pycnostachyum*, Ell., the Indian Black-root. Said to possess tonic and emmenagogue and oxytocic properties. The latter is an interesting announcement as bearing on its well-known narcotic properties.

NATURAL ORDER GENTIANACEÆ.

17. *Gentiana ochroleuca*, Froel., the Sampson Snake-root. Dr. Lane confirms its value as a substitute for the other gentians.

NATURAL ORDER LOGANIACEÆ.

18. *Gelsemium sempervirens*, Ait., the Yellow Jessamine. Concerning this, the most important and valuable upon the list, and one of the most valuable plants in the entire materia medica, the doctor speaks in no stinted terms. In his hands, and in the hands of his acquaintances, it has sustained the reputation it has generally gained. An interesting fact is that a majority of the country practitioners in that section prepare their own extracts, using eight ounces of the bark of the green root to the pint of dilute alcohol. If this practice is general throughout the south, it would materially affect the estimate of the consumption of this drug.

NATURAL ORDER AMARANTACEÆ.

19. *Telanthera polygonoides*, Moq. Reported under the name "Piss-a-bed," and as a diuretic and anti-spasmodic, used in cases of strangury.

We would repeat that it is most desirable that similar reports, accompanied in all cases by specimens showing as much as possible of the plant, mailed flat between sheets of pasteboard, should be contributed, particularly from the south and southwestern regions.—*Therap. Gaz.*, Dec., 1884, p. 546.

THE DISPUTED IDENTITY OF THE RED BARK OF THE
NILGIRIS.

BY W. T. THISTLETON DYER, C.M.G., F.R.S.

Assistant Director, Royal Gardens, Kew.

I cannot but regret that Mr. Cross has reopened in the pages of the "Pharmaceutical Journal," a question which I imagine most persons interested in the subject had hoped had been finally laid to rest.¹

In 1880, Mr. Cross was employed by the India Office to take out to the Nilgiris the plants of Santa Fé and Carthagena barks which had been under his charge in the Royal Gardens, Kew. After successfully accomplishing this difficult task, he remained in India for some time in charge of the plants.

Early in 1882, I received a letter from Mr. Clements Markham, inclosing one from Mr. Cross, dated Government Gardens, Ootacamund, 21st January, 1882. From this I extract the following passage:

"After the fullest and most careful examination of Neddivattum plantation, I found that the most stupendous mistake that has ever occurred in the history of planters has been committed. The whole plantation, instead of consisting, as was believed, of pure *succirubra*, does not contain more than 5 per cent. of that species, the remaining 95 per cent. being of the gray bark or Huanuco sort, which, botanically, is either the *C. micrantha* or *C. peruviana*."

Mr. Cross subsequently wrote to Kew, March 21, 1882, to much the same effect.

The Government of Madras regarded Mr. Cross's statements as of sufficient importance to deserve careful investigation. Surgeon-Major Bidie, M.B., Superintendent of the Government Central Museum, Madras, was accordingly instructed to report upon them and to make a careful collection of specimens of every kind of cinchona grown at Naduvattum for transmission to Kew.

Surgeon-Major Bidie met Mr. Cross at the plantations, and with regard to the question raised he reported to his Government, March 3, 1882:

"With reference to the assertion that the tree called by us *Cinchona succirubra* is a gray bark, *C. micrantha*, my first act was to show Mr. Cross exact reproductions of Fitch's plates of the two species¹ but without any

¹ See paper by Rob. Cross' on page 96.

² From Howard's "Nueva Quinologia of Pavon."

names attached, and as he hesitated about giving an opinion as to which was the red bark, I did not then push the inquiry further. Subsequently, while collecting botanical and bark specimens, I was in daily intercourse with Mr. Cross, but found that he was immovable from his assumption that a mistake had been committed as regards the identity of the red bark tree.¹ I attach no importance to this however, for, notwithstanding his presumed familiarity with the botanical characters of the red bark, he took nearly a year to arrive at this conclusion and never even hinted at the possibility of such an error when in constant communication with a botanical expert like Colonel Beddome. In my opinion there can be no doubt that the tree known as the *Red bark* on the Government Plantations is the *Cinchona succirubra*, Pav., and it does not seem necessary to occupy the time of Government in offering proofs that such is the case, although for my own satisfaction I went carefully through all the botanical evidence on the subject."

The Governor of Madras, Mr. Grant Duff, himself no mean botanist, had previously looked into the matter personally. I quote the official minute in which he records his own opinion :

Minute by the Right Honorable, the Governor, dated January 26, 1882.

"Para. 9. From Ootacamund I went on to Neddiwuttum, where Dr. Bidie was established, busily engaged in examining our plantations with Mr. Cross and making a most complete collection of all those specimens which would be required for finally setting to rest the doubts as to the genuineness of our *succirubra* with which Mr. Cross fluttered us a few weeks ago. Col. Jago was most anxious that Mr. Cross should have the fullest opportunity of stating his views to me, untrammelled by the presence of a third person. We went accordingly alone into the woods together, and he pointed out to me what he called 'true *succirubra*,' 'succirubra of the Pata variety,' and 'micrantha.' Colonel Jago then joined us and we went together to one of the trees, which our people have hitherto believed to be *micrantha*, and read the description of the tree under its branches. Most unquestionably the tree that we have hitherto called *micrantha*, and not the tree which Mr. Cross has now taken it into his head to call *micrantha*, is the *micrantha* of the books; that is, the *micrantha* heretofore known to botanists. The distinctions between it and any form of *succirubra* are most clearly marked, and are infinitely wider than the distinction

¹ His Excellency, the Governor, on his visit to the estates, at once saw Mr. Cross's error, and pointed it out to him, but he still adhered pertinaciously to his assertion.

between the two varieties of *succirubra*, one of which, Mr. Cross, who never was, I believe, in the *micrantha* country, which lies far to the south of the district which he knows so well, has recently christened *micrantha*.

"10. I left our plantations with no shadow of doubt upon my mind, and wish all botanical questions were as easy. I may add, too, that I, on more than one occasion, introduced the subject while in the Wynaad, with a view to seeing whether Mr. Cross's doubts had created any alarm among the planters; but I found them treated, on all hands, as illusions."

At Kew we had exceptional opportunities for testing immediately the accuracy of Mr. Cross's statements. Colonel Beddome had sent us a splendid set of dried specimens of every *cinchona* form grown in the Nilgiris, on which we reported early in 1882. Besides these we possess in the case of *C. micrantha* authentic specimens of the South American plant collected by Weddell and by Pritchett, in addition to what is presumably a type from Ruiz and Pavon's herbarium. Besides abundance of Indian specimens, we have one in particular known to have been raised at Ootacamund from Pritchett's seeds, and the accurate determination of which has been verified by Howard. In the case of *C. succirubra* we have Spruce and Cross's own specimens from the slopes of Chimborazo and a specimen, presumably from Ruiz and Pavon's herbarium, verified by Howard. Colonel Beddome's admirable specimens were carefully examined by my colleague, Professor Oliver, the Keeper of the Kew Herbarium, and he found no reason to doubt that the species of *Cinchona* which passed as *micrantha* and *succirubra* on the Nilgiris were what they professed to be. Dr. Trimen, the Director of the Royal Botanical Gardens, Ceylon, also examined them (together with the further set collected by Dr. Bidie) with me while he was at home on leave in 1882, and we could see our way to no other conclusion.

Finally, Dr. Trimen, at the invitation of the Madras Government, visited their *cinchona* plantations in 1883, and reported upon them.

What he says on the subject of the red bark may be taken as the last word in the matter:

"*C. succirubra*, Pav.—In regard to red bark I can very confidently endorse the opinions expressed by all the botanists who have examined the matter, that the well-known tree which forms the bulk of Naduvatam is

the true *C. succirubra*, Pav. I have examined Pavon's own specimens in the British Museum, which precisely correspond with the ordinary red bark of India, Ceylon and Jamaica."

Mr. Cross has further expressed the opinion, in which he has received more independent support than in the other case, that the hybrid form commonly met with in our Indian plantations, and now generally known as *Cinchona robusta*, is identical with the *Pata de Gallinazo* of Chimborazo.

In this identification I equally disagree with him. As the investigation of the matter led to a good deal of correspondence, I cannot do better than quote the passage from the Kew Report for 1882 (pp. 38, 39), in which the net result of the whole discussion is briefly summarized by Sir Joseph Hooker:

"*Cinchona robusta*.—In the Kew Report for 1881, pp. 25, 26, I referred to the hybrid between *succirubra* and *officinalis*, which seems in the east first to have made its appearance in Ceylon, and thence to have been introduced by seed into the Sikkim plantations.

"This form has, during 1882, given rise to a rather protracted correspondence with the Madras Government. Mr. Cross, who was employed by the India Office to convey the Columbian barks from Kew to Southern India, insisted that the two supposed hybrid forms grown on the Nilgiris, under the names of *pubescens* and *magnifolia*, were not hybrids but distinct species, of which the seed had been sent by himself from the slopes of Chimborazo. After some shifting of opinion, he seems finally to have settled down to the statement that *magnifolia* was the *Cinchona* called in the Chimborazo bark district 'Pata de Gallinazo,' that *pubescens* was true *succirubra*, and that the *succirubra* of the Madras plantations was *micrantha* (gray bark).

"In all these identifications his recollections of plants seen no less than twenty years before seem to have misled him. Unfortunately, his views were, to a certain extent, adopted by the eminent quinologist, Mr. Howard, and it therefore became necessary to critically examine them, as such gigantic errors in nomenclature could not but very seriously affect the future policy of administration of the Madras cinchona plantations.

"Under instructions from the Madras Government, very copious and carefully prepared sets of all the *Cinchonas* cultivated in the Nilgiris were despatched to Kew, both by Colonel Beddome and by Surgeon-Major Bidie, the Superintendent of the Madras Central Museum. They were very thoroughly examined, and there appeared no valid reason for disputing the accepted names under which the plants had been grown or for adopting those assigned to them by Mr. Cross.

"The authentic specimens of the Pata de Gallinazo, collected by Spruce, and described by him in his official report, are preserved in the Kew Herbarium. They have been subsequently identified at Kew by Spruce (con-

firmed by Howard) with *C. erythrantha*, Pav., and Triana, the most recent monographer of the genus, has referred this species as well as Spruce's specimen to *C. pubescens*, Vahl. Neither the *magnifolia* nor *pubescens* of the Nilgiri plantations can in any way be confounded with *Cinchona pubescens*, Vahl, but are, no doubt, as has always been contended, marked members of the variable series of hybrids which appear to invariably arise in plantations where *officinalis* and *succirubra* are cultivated in proximity.

"Mr. Cross's other two conclusions proved equally baseless. As, however, these questions of synonymy had excited a good deal of perplexity in Ceylon as well as in Southern India, I suggested to the Government of Madras that Dr. Trimen, the Director of the Royal Botanic Garden, Peradeniya, should be invited to visit the *Cinchona* plantations of the Madras Government, in order to bring about, if possible, some uniformity of nomenclature in the forms and species of *Cinchona* cultivated both in Ceylon and Madras. This he accordingly did, and he has given the results of his exhaustive study of the whole question in a very able and lucid report (dated June 30, 1883), which, representing, as it also does, the opinions arrived at by the Kew staff, appears to me to finally dispose of the whole subject. Both the names *pubescens* and *magnifolia* Dr. Trimen, for reasons which he gives, proposes to discard in favor of *robusta* which is in use on some estates in India, and 'is now commonly employed in Ceylon for the trees in question.' Dr. Trimen describes those he saw on the Nilgiris in the following words: 'I found the forms to be just those so common in Ceylon plantations. Generally robust well-grown trees, larger, hardier, and healthier than either the *officinalis* or *succirubra*, among which they were scattered, and often flourishing where neither of them can thrive. Botanically. there was the same range of variety, the extreme form in one direction, with its dark green smoothly shining leaves, closely approaching some of the large-leaved forms of *C. officinalis*; and that in the other direction with its larger, paler, thinner leaves, more or less pubescent beneath, so close to the hairy form of *C. succirubra* as to be often with difficulty distinguished from it. Between these, as regards color and pubescence, were many intermediates, though, undoubtedly, with a little ingenuity, the whole can be thrown into two groups.'

"He further adds: 'We have direct testimony of its origin. I am assured by planters of credit that they have grown both glabrous and pubescent *robusta* from seed of ordinary *officinalis*, and that it is by no means unfrequent for seedlings of them to appear in seed-beds on estates where no trees but *officinalis* and *succirubra* occur. I have myself seen seedlings of *robusta* self-sown where there are no parent trees of the sort whence they could have been derived; and at one time I was inclined to regard it merely as a variety of *officinalis*. There are, I think, grounds for believing that *succirubra* generally supplies the pollen, and is, therefore, the male parent, both in the case of *robusta* (*succirubra* and *officinalis*) and *anglica* (*succirubra* and *Calisaya*).'" — *Phar. Jour. and Trans.*, Dec. 20, 1883.

PARALDEHYDE IN MENTAL DISORDERS.—Benda has used paraldehyde as a hypnotic in 34 cases of mental disorder, in doses varying from fʒss to fʒii. In 16 cases sleep was produced; in the remaining cases the action was uncertain or entirely negative.—*Med. and Surg. Rep.*, Nov. 29, 1884.

RED BARK.

BY ROBERT CROSS.

A little over two years ago, after arrival on the Nilgiri hills, in Madras, with a collection of cinchona plants—for which I was sent by the India Office to South America—I called attention to the mistake which had been committed in planting at Naduvatum and other places on the hills a comparatively useless cinchona, the Huannuco bark of Pern, for the true “red bark” of Chimborazo, *Cinchona succirubra*, plants of which were dug up by myself on the slopes of that mountain and brought direct to India twenty years previously. To those who thought I might be mistaken in my assertions I may say that, after having dressed and transplanted the original stock of “red bark” plants *twice* in their native forest, I would just as likely be liable to mistake my own handwriting.

At the time of the introduction of the cinchonas into India it so happened that the Huanuco and “red barks” reached the Nilgiris about the same time, were propagated in the same hothouse, and so had become indiscriminately mixed up together. In this way the “red bark” was lost sight of, and was mistaken for the Huanuco species, which it resembled in the form and color of the leaves, especially when forced in a hothouse. As the plantations grew up a sprinkling of “red bark” trees were found thinly dispersed therein. Had the two sorts been kept carefully separate the loss experienced by planters and others would have been avoided. An examination of the cinchona blue books will show that it never was intended to cultivate the Huanuco bark to any extent.

In India, as in South America, two distinct varieties of “red bark” are observed. One of these, which possesses smooth foliage, is called by South American collectors *Pata* bark; while to the other, the leaves of which are hairy underneath, the term *teja* or “tile” bark is applied. These sorts are not kept separate in commerce. The *Pata* sort, however, seems to inhabit a rather higher zone on the mountain slope, and so may prove hardier than the other. Probably both varieties are of equal merit as quinine-producing plants.

Before leaving India I collected a little bark of both sorts for purposes of comparison, together with a few samples of “crown” bark. Most of the samples were taken from renewed trees, the aim being to

secure as near as possible bark of each sort of the same age. Yet it will be understood that, even among trees of similar size, one tree from any particular circumstance may develop slightly thicker bark in the same space of time than another which may be growing under more modified conditions. The trees selected were growing at the same general elevation. The special objects in view were:

1st. To compare the yield of the *Pata* with the "tile" bark.

2d. To place these two sorts against "crown."

3d. To observe the increase of alkaloid which takes place as the bark grows older.

To the obliging kindness of David Howard, Esq., F. C. S., I am entirely indebted for the examination of the samples, a copy of which is annexed.

No.	Analysis of samples referred to by D. Howard, Esq., F. C. S.	Quinine sulphate, per cent.	Quinine alkaloid, per ct.	Cinchonine alkaloid, per cent.	Cinchonidine alkaloid, per cent.	Quinidine alkaloid, per cent.
1...	True "red bark," <i>C. succirubra</i> , <i>Teja</i> , or "tile" variety of South American bark collectors, one year old renewed bark.....	5.32=	4.00	1.42	0.66	0.14
2...	True "red bark," <i>C. succirubra</i> , "tile" variety, two years old renewed bark.....	4.40=	3.30	trace	0.23	0.06
3...	True "red bark," <i>C. succirubra</i> , <i>Pata</i> variety, one year old renewed bark.....	5.68=	4.26	trace	0.08	0.08
4...	True "red bark," <i>C. succirubra</i> , <i>Pata</i> variety, two years old renewed bark.....	5.82=	4.37	trace	0.32	0.17
5...	"Crown," one year old renewed bark.....	2.60=	1.95	trace	trace	0.18
6...	"Crown," two years old renewed bark.....	3.10=	2.33	0.17	0.06	0.17
7...	"Crown," three years old renewed bark.....	7.64=	5.23	0.38	0.48	0.66
8...	"Crown," four years old renewed bark.....	8.80=	6.60	trace	0.12	0.37
9...	"Crown," apparently original bark. Tree twelve years old.....	12.30=	9.22	0.00	0.12	0.64
10...	Root bark from large primary roots of true <i>C. succirubra</i> , <i>Pata</i> tree, 20 feet high.....	4.68=	3.51	2.10	2.28	0.77
11...	"Crown," a variety with small leaves, the <i>Paramo</i> bark of Loxa collectors, three years old renewed bark.....	6.28=	4.69	1.03	0.48	0.34

I beg to direct attention to the small proportion of the inferior

alkaloids contained in the bark when compared with the yield of quinine. It seems to me that when really good sorts of trees are properly cultivated and carefully managed, a steady yield of the best alkaloids may be relied on. It would, I think, be important to ascertain the highest *sustained* yield of quinine that any or all of the best species can attain to. On this, in my opinion, rests the future prosperity of planters wherever bark trees are cultivated.—*Phar. Jour. and Trans.*, Dec. 13, 1884, p. 463.

PINE OR FOREST WOOL. (WALD-WOLLE. LAINE DES BOIS.)

BY THOMAS GREENISH, F.C.S., F.R.M.S.

About the year 1840 a new and curious industry sprang up at a place called Humboldtsau, or the Meadow of Humboldt, situated near Breslau, Upper Silesia, which, like most novelties, had for several years to struggle with difficulties before it could be said that its position was established,—that, in fact, it occupied a place in the estimation of the public or was noticed by the medical profession. This industry consisted in the utilization of the acicular leaves or leaflets of the pine in the production of a substance to which the name “Wald-Wolle,” rendered pine or forest wool, was applied; and it evidently extended itself, for there subsequently arose new manufactories at Remda in the Thüringen-Wald; at Jonköping in Sweden; Wageningen in Holland; as well as in some parts of France.

Schledel, in his “*Waaren-Lexicon*,”¹ mentions this substance under *Wald-Wolle*, and describes it as “the fibres of the needles of *Pinus sylvestris*, also of the black pine, *Pinus niger austriaca*, fabricated after the process introduced by Joseph Weiss, of Zuckmantel, Austrian Silesia. When prepared, it resembles horsehair, and has been used for stuffing mattresses, which purpose it seems to have fully answered, and the mattresses stuffed with it possess an aromatic odor. In the process of its manufacture a volatile oil is obtained called Wald-wolle-öl, or forest-wool oil, which is used as an external application in rheumatic affections. The Wald-wolle products can be procured in Berlin, Vienna, Leipzie, etc.”

¹ Sixth edition. Leipzie, 1850.

According to Hager,¹ Weiss used the fibre of the pine leaf in the manufacture of paper, and observed that those workmen who happened to be afflicted with gout or rheumatism were relieved by the application of the pine-needle products. Hence their introduction as remedial agents into medical practice.

Simmonds, in his "Dictionary of Trade Products," calls the article pine-needle wool or pine-wood wool, "a fibrous vegetable substance obtained in Prussia by treating the buds and leaves of coniferous trees with a strong solution of carbonate of soda. The fibre, so obtained, is used there for upholstery purposes, such as stuffing for mattresses, intended as a protection against insects, and also for wadding; blankets are made with it; and oil and soap are also obtained from it."

The term *pine-wood-wool* is incorrect, and confounds this with a very different article, called "*Holz-wolle*," also of German origin, consisting of the pine wood reduced to a coarse fibrous powder, an article which impregnated with bichloride of mercury is now recommended as an antiseptic dressing in surgery.

In the "*Journal d' Agriculture pratique*,"² there is an article by Professor Charles Morren—mainly a translation from the *Bernische Blätter für Landwirthschaft*, January, 1852, "Note on the Vegetable Wool extracted from the Leaves of the *Pinus sylvestris*," of which the following is a summary: In the neighborhood of Breslau, in Silesia, in a property called the Meadow of Humboldt, there exist two establishments—one a factory where the leaves of the pine are converted into a kind of cotton, called pine or forest wool; the other an establishment for invalids, where the waters used in the manufacture of the pine wool are employed as curative agents, affording relief to the sufferers from rheumatism. Both of these owe their existence to Monsieur De Pannewitz, inspector of forests and inventor of a chemical process, by means of which there is extracted from the long and fine pine leaves a fibrous substance called forest wool, because it curls, felts, and can be spun as ordinary wool.

The wild pine, from which this wool is obtained, is much esteemed in Germany for its many valuable properties, and instead of leaving it to its natural growth, extensive plantations are cultivated, and the use Monsieur De Pannewitz has made of the leaves will contribute to extend the cultivation of the pine in other countries.

¹ "*Pharmaceutische Praxis*".

² Vol. v, 1852, p. 322.

The acicular leaves of pines, firs, and conifers in general, are composed of a bundle of fine and tough fibres, surrounded and kept together by a resinous substance. Boiled with an alkali, the resinous substance is dissolved, when it is easy to separate the fibres and to wash and free them from all foreign substances.

According to the process employed and the leaves used, the woolly substance is of a fine quality or remains in a coarser state.

In the first case it is used as wadding—in the second for upholstery purposes.

The first use that was made of this filamentous substance, was to substitute it for cotton or wool wadding in quilted blankets. In 1842 the hospital of Vienna bought 500 of these blankets, and after a trial of several years a further supply was ordered. It was observed that under the influence of pine wool no noxious insects sheltered in the beds; it was found also that the aroma was agreeable to the occupants. Soon after the workhouse of Vienna was furnished with similar quilted blankets.

Similar articles, as well as mattresses, stuffed with the wool, have been used in the hospital of charity, in other hospitals at Berlin, and in the barracks of Breslau.

An experience of five years in these establishments has proved that articles made of pine wool are very useful and durable, never troubled with moths and only one-third the price of horsehair. Besides, it can be spun and woven. The finest quality gives a yarn resembling hemp and equally strong. Spun and woven as cloth it yields a fabric that may be used for carpets, horse blankets, etc. The exhibitors of these products were awarded a bronze medal at the Exhibition of Berlin, and a silver one at that of Altenburg.

Such is the account given by Professor Morren of the pine-wool productions, but I am informed that the quilted blankets referred to by him are not now used in the Vienna Hospital, straw having superseded the pine wool as a stuffing for mattresses.

Bentley¹ says: "From the leaves of this species (*Pinus sylvestris*), the substance called pine wool or fir wool is prepared. It is used for stuffing mattresses, etc., and is said to be repulsive to vermin. Wadding for medical use, and cloth for various articles of dress, etc., are also manufactured from these leaves."

¹ "Manual of Botany," 1882, p. 678.

Martindale¹ thus refers to it: "Fir wool or fir-wool wadding, obtained from the pine leaves, is sold as a brownish-yellow fibre, in sheets like cotton wool. It has a faint agreeable odor of the pine leaf, and is manufactured into blankets, jackets, spencers, stockings, etc."

The two last authors refer to the source of true pine wool, but describe an entirely different article.

In the "National Dispensary," Stillé and Maisch refer to these products, and state that "the leaves of the different species of pine, when distilled with water, yield volatile oils, which differ from the volatile oils obtained from the resin of the same species. Such an oil is known, and to some extent employed in Germany as *Fichtennadelöl* (fir-leaf oil), and the leaves by pounding are converted into a fibrous substance known as *Fichtenwolle* (fir wool)."

I am indebted for samples of the true pine or forest-wool, wald-wolle, to M. Bernardin, Musée de Melle, Belgium, to Herr Dittrich, Prague, and to Dr. Maschke, in Breslau. I have also received two samples from S. Graetzer, of Carlsruhe, the depot for conifer preparations of Humboldtsau. These two differ in quality; the finer is labelled "adapted for coverlets," and the coarser for "stuffing cushions." This substance, more or less fine, and with a faint pine odor, constitutes the article known as Wald-wolle, pine or forest wool, throughout Germany and the Continent generally, and all authorities to which I have had access agree as to its origin, the pine leaf; its character, a fibrous substance; and the several uses previously enumerated, to which it has been applied with more or less of success.

Some eminent members of the medical profession on the Continent have spoken favorably of these pine-wool productions, but whether they deserve or not the high encomiums passed on them it is nevertheless an important fact that a material, before considered almost useless, is now converted into articles of domestic utility.

The several samples just referred to, more or less coarse, of a reddish-brown color, as forwarded to me from those different sources, were subjected to a careful histological examination, and were found to be composed of the tissues of the pine leaf.

Fig. 1 is a transverse section of the leaf of *Pinus sylvestris*, and presents to the naked eye three very distinct tissues, *A*, the epidermal layer; *B*, the fibro-vascular bundles, composed of bast and wood cells; *C*, the parenchymatous chlorophyll tissue, with the oleo-resin secret-

¹ "Extra Pharmacopœia," 1883, p. 216.

ing cells; and *D*, the parenchymatous tissue surrounding the vascular bundles.

Fig. 2 shows the tissues of which these fibrous substances are composed. *A*, the epidermal tissue, a series of elongated cells alternating with a series of tabular cells, the latter containing the stomata; the side walls have an undulating outline, so that the adjoining cells fit into each other. The parenchymatous tissue within the epidermal layer and that surrounding the vascular bundles, fundamental tissue, being thin and delicate, is for the most part disintegrated and destroyed in the process for the preparation of the wool, leaving the more tenacious epidermal cell tissue (*A*) with the fibro-vascular bundles, represented by *B* the bast cell, and *C* and *D* annular and spiral vessels, as the component parts of this fibrous material.

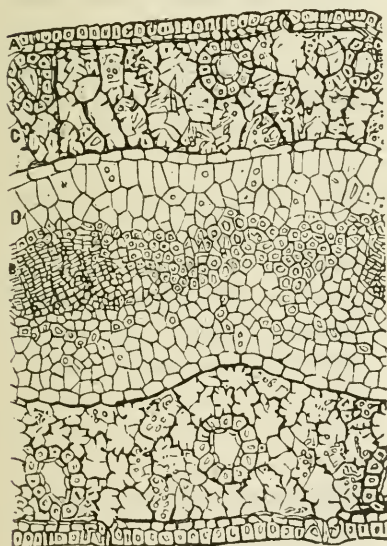


FIG. 1.

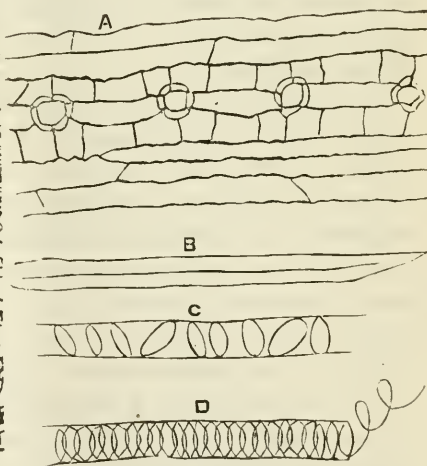


FIG. 2.

The several tissues of each sample were found to correspond with those in the leaf of the pine; there was no tissue found that had not its counterpart in the pine leaf, and the pine leaf being equally examined had no tissue that was not present in the samples of this fibrous material.

It is therefore evident that this fibrous substance, to which the term pine or forest wool was originally applied, and to which it now applies

throughout Germany, the birth-place of the industry, is manufactured from the acicular leaves of one or more species of pine previously exhausted of its volatile oil and extractive in the process of boiling.

There is now in English commerce a fibrous article, in sheets like cotton wool, to which the same names of pine or forest wool, pine and fir-tree wool, pine leaf wool, are indifferently applied. Samples of this substance were obtained from different sources, but they so clearly corresponded that they pointed to one common origin. They were subjected to a micro-chemical and microscopical examination with the view of determining the true nature of an article which is just now, as a fibrous material, and also as forming textile fabrics, receiving more or less of attention from the medical profession as well as the public.

The samples were composed of fine fibres of a reddish-brown color. When boiled in water the color was not affected. Boiled in a solution of caustic alkali a faint pine leaf odor was perceptible and the color was partly discharged. A solution of chlorine completed the bleaching process, leaving a white fibrous material which was afterwards washed and dried.

A few threads only of the bleached fibres were used for the application of the following reagents :

Chloro-iodide of zinc produced a violet tint. A solution of iodine, followed by sulphuric acid, gave a blue color. The fibres dissolved completely in a solution of ammonio-oxide of copper. The results from these simple experiments were sufficiently convincing that the fibres in question consisted of pure cellulose, and not that altered or lignified condition of cellulose which the fibrous materials previously referred to show under the same reagents.

It will be understood that these experiments were conducted under the microscope, and that two or three fibres only were used on each occasion, so that the observer was enabled to follow the delicate reactions which were not visible to the unaided eye. The individual fibres were then placed under the microscope, aided by polarized light, and from their physical characters, which confirmed the results of the previous chemical reagents, it was evident that they were neither more nor less than the unicellular hairs on the outer coat (*testa*) of the seed of *Gossypium* which constitute ordinary cotton, whose habitat is not Thuringia, but rather the Southern States of America or one of the other cotton producing countries of the East, and that it owed its brown

color not to extractive from the pine leaf, but to the application of the usual dyeing material for that purpose. That peculiar epidermal cell tissue which characterizes the pine leaf was entirely absent.

In addition to this fibrous article now described, there is another material called "pine foliage forest wool flannel," hygienic flannel, also "from the forest of Thuringia," claiming public and professional patronage. It professes to be made from the fir wool, the produce of the Black Forest fir, *Pinus sylvestris*. This is a woven material of the same color as that previously described. The warp was detached from the weft in order that they might be examined separately; the warp when the dye was removed corresponded in every respect with the fibre previously examined and behaved in a like manner with the same reagents; in fact it was cotton. The fibres of the weft were next examined. In burning they gave off that peculiar horny empyreumatic odor indicating an animal origin; boiled in caustic alkali they were completely dissolved; examined under the microscope the imbrications on the individual hairs proved previous suspicions to be correct, that this fibre consisted of wool. The woven material was, therefore, a combination of ordinary cotton and sheep's wool, the former probably rather preponderating.

These fibrous materials profess to owe their origin to the leaves of the *Pinus sylvestris*; but the venation of most of the Coniferæ is simple, one single unbranched midrib, and the only available true fibres are the fibro-vascular bundles of this midrib, which are surrounded by parenchymatous tissue. The fibro-vascular tissue of the midrib shows with the previously-mentioned reagents a distinct difference from that of cotton.

It would appear, then, that this "curious industry," consisting in the utilization of the leaves of the pine in the formation of a fibrous material called pine or forest wool, has given birth to another *curious industry*, which is endeavoring to attract the attention of the medical profession; the results of this investigation may assist in determining its true value as an addition to our remedial appliances.—*Farm. Jour. and Trans.*, Nov. 15, 1884, p. 381.

PAIREIRINE HYDROCHLORATE has been found valuable by Dr. Ferreira in chronic cases of latentague, in doses of 2 grams or more a day—*Lancet*, December 6, 1884. This is doubtless the alkaloid of pareira brava, which is better known as *pelosine* and is regarded as being identical with *buxine* and *bebeerine*.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Drosera rotundifolia.—H. Büsgen has made comparative experiments intended to answer the question whether the capture of insects by these and similar plants assists their development. The experiments were made with seedlings grown in peat, which were previously boiled in a nutritive solution; these were placed on saucers and covered with bell glasses; one set were fed with the lice from vine leaves, the other received no such nourishment. The unfed plants were less strong and healthy, 16 plants producing 9 flower branches and 20 capsules, while 14 of the fed plants produced 17 flower branches and 90 capsules; the total dry weight of the fed plants was 0.352, and of the unfed plants 0.119 grams. Other trials under less favorable conditions gave similar results, and the author considers it as proved that the plants of *drosera* are capable of utilizing animal food and assimilating it beneficially for the production of seeds.—*Jour. Chem. Soc.*, 1884, p. 917; *Bied. Centr.*, 1884, p. 47.

Pinus Sylvestris.—Phenol has been found in this tree by A. B. Griffiths, the quantity present in the different parts being in the old stem 0.1021, in the young stem 0.0654, in the leaves between 0.0936 and 0.0315, and in the cones between 0.0774 and 0.0293 per cent.—*Chem. News*, vol. 49, p. 95.

A New Cotton Plant—For many years A. A. Subers, of Macon, Georgia, has been carefully experimenting to hybridise the cotton plant that grows wild in Florida, with the common okra. The new plant retains the okra stalk and the foliage of the cotton. Its flower and fruit, however, are strikingly unlike either cotton or okra. The plant has an average height of two feet, and each plant has only one bloom. This is a magnificent flower, very much like the great magnolia in fragrance, and equally as large. Like the cotton bloom, the flower is white for several days after it opens, after which it is first pale pink, and gradually assumes darker shades of this color until it becomes red, when it drops. For about ten days the fruit resembles the cotton boll, and then its growth suddenly increases, as if by magic, until it reaches the size of a big cocoanut. Not until it reaches this size does the lint appear. Then its snowy threads begin to burst from the boll, but are securely held in place by the okra like thorns or points that line the boll. One experienced picker can easily gather 800 pounds a day,

and fast hands much more. Each boll produces about two pounds of very long stapled cotton, superior to the Sea Island, and at the bottom of the boll there are from four to six seeds, resembling persimmon seed. This new cotton, therefore, needs no ginning. Such a plant would revolutionize the cotton industry of the South.—*Florida Times-Union*.

Epilobium angustifolium, Linné.—J. W. Chickering, Jr., relates in "Botanical Gazette," that a tract of about four thousand acres of cleared land in Maine, from which the underbrush had been burned in June, was in the following August covered with the plant named flowering. The plant is locally known as *fireweed*, which name is usually applied to *Erechthites hieracifolia*, Rafinesque, and in some localities to *Erigeron canadense*, Linné. *Senecio gracilis*, Pursh, is also said to be called fireweed in some places.

Crescentia Cujete, Linné.—The fruit of the calabash tree was analyzed by Dr. Peckolt, who ascertained the presence of an aromatic compound, bitter principle, two resins, tannin, tartaric acid, malic acid, a dark blue coloring matter, sugar, etc., and isolated, a new acid, named crescentic acid, which is precipitated by lead acetate. An alcoholic extract of the pulp acts as a mild aperient, in doses of 0.1 Gm. and as a drastic without griping, in doses of 0.5 Gm. Boiled with water and vinegar the pulp is used as an application in *erisypelas*.—*Rundschau*, N. Y., August, 1884, p. 166.

Bartung is a seed in great repute in Persia for dysentery. A sample of the seed received by Colonel Beddome, F. L. S., from Persia, was sowed at Kew, and according to W. T. T. Dyer, turned out to be *Plantago major*. Dr. Forbes Watson in his "Index to Native and Scientific Names," gives the following identifications of *bartung* with various species of *Plantago*, viz., *Pl. lanceolata*, Lin. (Irvine), *Pl. major*, Lin. (Honigberger) and *Pl. Psyllium*, Lin. (Birdwood).—*Phar. Jour. and Trans.*, Aug. 9, 1884, p. 101.

Under the name of *semences de psyllium* (*herbe aux puces*) the French Codex recognizes the seeds of *Pl. Psyllium*, Lin., and (?) of *Pl. arenaria*, Waldstein et Kitaibel. The seeds of the latter are somewhat smaller and darker colored than those of the preceding species. The larger and lighter colored seeds of *Pl. Cynops*, Lin., are said to be likewise used as *psyllium* seed or *fleaseed*. The mucilage obtained from these seeds is stated to be used in Southern Europe in the finishing processes of muslin.

Soja hispida.—E. Meissl and F. Böcker give the composition of the soja bean, in round numbers, as follows: water 10, soluble casein 30, albumin 0.5, insoluble casein 7, fat 18, cholesterin, etc. 2, dextrin 10, starch 5, cellulose 5, ash 5 per cent., traces of sugar and amido compound.—*Jour. Chem. Soc.*, 1884, p. 918; *Bied. Centr.*, 1884, p. 52.

Bassia longifolia.—E. Valenta ascertained the seeds to contain fat 51.14, alcohol extract 7.83, tannin 2.12, bitter principle, soluble in water 0.60, starch 0.07, mucilage 1.65, soluble albumin 3.60, extractive 15.59, insoluble proteids 4.40, total ash 2.71 (in the soluble portion 0.95), fibre (and loss) 10.29 per cent. The fat is yellow, is bleached on exposure, and soon becomes rancid. It has the specific gravity 0.9175 at 15° C., melts at 25.3°, solidifies at 17.5 to 18.5, and contains considerable quantities of free fatty acids, but only a small amount of glycerol. It is partly soluble in alcohol, entirely soluble in ether, carbon bisulphide, benzene, etc., and contains palmitin and olein. The mixed fat acids obtained from the soap melt at 39.5° and solidify at 38° C.—*Dingt. Polyt. Jour*, vol. 251, page 461.

Oil of Rose has been prepared by Schimmel & Co., Leipzig, from roses grown in Germany; the oil is of a finer aroma than the Turkish oil, and solidifies at 32°C. The congealing point of Turkish oil of rose is given by Baur at between 11° and 16°C. The fusing point of the solidified oil is not given; according to Hanbury's observations (1859), this seems to be higher for oil distilled in northern localities; for oil of rose distilled in London melted between 30.5° and 32.2°C. (87° and 91°F.); Zeller (Studien, 1850) observed 37.5°C. for German oil.

Belladonine.—On boiling commercial belladonine with baryta solution the atropine contained therein is decomposed, and belladonine remains behind as a brown resin, which, according to G. Merling, cannot be crystallized. Its composition is $C_{17}H_{21}NO_2$. Dissolved in diluted alcohol, and boiled with baryta, it yields tropine and several acids, probably tropic, atropic and isatropic acids.

The liquid obtained above, after removing the baryta with carbonic acid, yields to ether several bases, among them the one named oxytropine by Ladenburg (see "Am. Jour. Phar.," 1884, p. 597), which the author believes exists ready formed in commercial belladonine.—*Berichte*, 1884, p. 381–385.

Annatto.—The two principal constituents are *orantin* and *carotin*, the former of which is obtained by digesting 50 Gm. of annatto with 100 Gm. of sodium carbonate in 1 liter of water, and evaporating to one-half, while carotin is prepared by digesting annatto in oil.—*Bied. Centr.*, 1884, p. 215. Carotin was discovered by Wackenroder (1832) in the root of *Daucus Carota*, *Linné*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 20, 1885.

The Pharmaceutical meeting of the College was held this day, Dillwyn Parrish, President, occupying the chair.

The minutes of the last meeting were read and adopted without alteration.

The Registrar presented to the College the report of the Superintendent of Public Schools, and a copy of the work entitled "Elementary Lessons on Electricity and Magnetism," by Silvanus Thompson; also a "Text-book of Physics," by Henry Kiddle; the first being from the Superintendent of the Public Schools, the other two from our fellow-member, Mr. John E. Cook. The thanks of the College were voted to the donors.

A paper upon "The Advantages of Preliminary Examination to Pharmacy and to this College," was read by Mr. Wm. B. Thompson, and on motion of Mr. Blair, seconded by Mr. Hancock, referred to the Committee of Publication (see page 65).

Prof. Maisch afterwards read the resolution which had been offered by Prof. Procter at the first Convention of Colleges, and was adopted.

Mr. Thompson thought that this did not change the spirit of Mr. Taylor's resolution, while Mr. Maisch believed that there was a decided difference, the former aiming at determining the educational acquirements of the young man before becoming an apprentice, and the other subsequently when the young man was seeking further instruction at a college.

Professor Maisch said that he well remembered the excellent paper by Prof. Parrish, referred to by Mr. Thompson, and that from his intercourse with Professors Procter and Parrish he was quite familiar with their views; that while both desired the apprentice to have completed his general education before entering the business, they had considered it wrong to exclude young pharmacists from the College. He said that in Europe the educational standard was determined before the young man was permitted to become an apprentice, but that afterwards he encountered no obstacle in pursuing his studies. In answer to a question by Mr. Blair, he explained that in Germany a young man had to attain a prescribed grade in the classical school, called *Gymnasium*, before he could become an apprentice (*Lehrling*), that his employer was by law compelled to instruct him in practical botany and chemistry, that at the close of his apprenticeship he had to pass an examination as assistant, and after having served for several years as such, could enter, without further examination, the university to

prepare himself for the final examination (Staats-examen) in the higher branches of his profession.

Mr. Blair said that Professor Procter had been in the habit of sending his young men to the College during the first and last year of their apprenticeship.

Prof. Maisch remarked, that at that time the junior and senior students heard the same lectures, and that he had no doubt that with the present graded courses, Prof. Procter would have sent his apprentices for three or four years. Referring to the admitted fact that pharmacy was vastly overcrowded, he said that the same was true of all other professions and trades. Regarding the legal status of medicine he said that the laws recently passed required of a practitioner of medicine the registration of a diploma, and that in Illinois and other States the Board could, and very properly did, discriminate between the schools and would not recognize diplomas from institutions that did not require sufficient preliminary education of their students. Not one of the numerous pharmacy laws required a diploma as evidence of qualification; many recognized pharmaceutical diplomas; a number recognized also medical diplomas; one law discriminated against the schools of other States; several recognized no diploma; but all the laws admitted to the practice of pharmacy those who could pass examination before the appointed Board; even in Philadelphia any person could carry on the drug business after passing the examination before the Board, without ever having been at a college of pharmacy. Prof. Maisch thought that all those who could legally enter the drug business, had a right to be instructed therein, and in his opinion, they deserved commendation, if they were seeking instructions beyond what was legally required of them.

Mr. Daniel S. Jones remarked that he was glad to be present and hear the subject discussed; that many present knew the active interest he had exhibited in the College in years past, and that circumstances rendered it too painful for him to frequent these halls as he formerly did; he nevertheless had a most abiding interest in the welfare of the institution, and he knew the views of those whose opinions had been quoted and how earnest they were in desiring only the best personnel in the ranks of pharmacists; he felt sure that good would come of the discussion of so important a topic.

Mr. Andrew Blair read a very modest advertisement about cod liver oil, which gave rise to considerable amusement. He also read a paper upon "*Spiritus Ammoniae Aromaticus*," showing the advantage of the product of the formula of the Pharmacopoeia of 1870 over the present official; the paper was accompanied with samples of the respective preparations. On motion, it was referred to the Committee on Publication (see page 79).

Mr. Worthington exhibited a bottle which had been enclosed in a tin can and had contained oil of bitter almonds; the stopper had been left out and the oil had been almost entirely volatilized, covering the inside of the can and the bottle with a film of crystals of benzoic acid, and it was for this reason brought to the notice of the meeting as a curiosity.

There being no further business, on motion, the meeting adjourned.

T. S. WIEGAND, *Registrar.*

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.

At the fourth social meeting, held January 13th, Dr. E. T. Bruen, of the University of Pennsylvania, delivered a lecture on "the germ theory of disease," giving a historical sketch of the various views held in regard to the contagiousness of certain diseases, more particularly since the discovery of spermatozoa, in 1679, in regard to malaria, fermentation, the physico-chemical theory, and, finally, the germ theory of the present day. He divided the infectious diseases into three classes, according to the manner in which they are communicated; explained the causes of immunity against various diseases, and pointed out the manner in which the growth and reproduction of the germs may be inhibited. The best agent for this purpose is mercuric chloride in very dilute solution, this being far more effectual than other chemicals; but the different germs do not behave alike, and there are only very few reliable germicides, the surest being destruction of the infected material by fire.

Mr. Sayre afterwards read a paper on "cocaine," giving a history of the coca plant, its cultivation and uses, and its chemical history, with the therapeutical uses of the alkaloid.

After various recitations the meeting adjourned.

EDITORIAL DEPARTMENT.

PRELIMINARY EDUCATION OF PHARMACISTS.—The deficient education of many young men entering upon the pursuit of pharmacy in the United States, has been frequently commented upon, and proprietors of drug stores have been repeatedly urged to pay more attention to the educational acquirements of those whom they take as apprentices; yet a practical plan of securing greater uniformity in their previous education has not been presented. The committee entrusted by the American Pharmaceutical Association with preparing the draft of a pharmacy law sixteen years ago, had this subject under consideration, and after a lengthy discussion could not discover a direct way, promising success, for accomplishing that which in Europe is reached by the enactment of laws or government regulations. A compromise was finally reached and agreed to by Professor Edward Parrish, who, however, had no hope that the point aimed at would be gained. This draft of a pharmacy law was reported to the Chicago meeting in 1869 and recommended by the Association; it recognized the existing state of things and provided for the future that pharmacists before commencing business, should become Graduates in Pharmacy, the avowed aim being that the Colleges of Pharmacy should be made responsible for the education of all pharmacists, and thus in an indirect manner secure the general education of the young men before they became *apprentices*.

Rhode Island is the *only* State where this law was enacted, in March, 1870, only to be repealed and modified in the year following. No other pharmacy law has had a provision with a similar object, either directly or indirectly. This failure, which came not unexpected to Professor Parrish,

induced him to write that paper, referred to elsewhere (see pages 67 and 73), on "The Preliminary Education of Apprentices," and while writing it he had also the counsel of Professor Procter, who agreed with the views expressed therein.

The laws regulating the practice of medicine, which have been enacted in a number of States, take precisely the position which was recommended to the pharmacists in 1869, and the Medical Colleges are now responsible not only for the knowledge in medicine and surgery, but also for the general culture of their graduates. If the Medical Colleges in the United States would cease to exist, no one could become a physician in the States referred to, except by studying and graduating in a foreign country. But if all the Colleges of Pharmacy in the United States were wiped out of existence, the number of pharmaceutical aspirants would not be less—perhaps greater—than at present, because *no* pharmacy law makes attendance and graduation at a College a prerequisite for carrying on the drug business. The difference between practitioners of pharmacy and of medicine will still be greater if the efforts now being made in several States should be successful requiring of the latter to be graduates in medicine *and* to pass a professional examination before a board of physicians not connected with a medical school.

It is our conviction that there is a decided improvement in the personnel of the pharmacists throughout the country; but it is not denied that there is room for more improvement; this, however, should come in at the *beginning* of the pharmaceutical career, if the claims of pharmacy as a profession are to be made good and maintained. In whatever manner the desirable liberal preliminary education may be secured, it certainly cannot be done by excluding those in quest of further instruction from the present or other educational institutions, since they cannot, on these grounds, be prevented from carrying on the apothecaries' business.

OBITUARY.

DR. HERMANN KOLBE, Professor of Chemistry at the University of Leipzig, died suddenly, November 25th, in the 67th year of his life. He studied chemistry under Wöhler and Bunsen, and was for a time assistant to Playfair, in London, and occupied for 14 years the chair of chemistry at the University of Marburg. His investigations are very numerous; the synthetical preparation of salicylic acid from phenol has made his name widely known, also among those not directly interested in chemistry. He was the author of several works on chemistry, and of numerous essays which were mostly published in the "*Journal für praktische Chemie*," edited by him. He was a sharp critic and fearless in expressing his convictions of what he conceived to be wrong.

DR. BENJAMIN SILLIMAN, Professor of Chemistry at Yale College, died January 14th, aged 69 years. For seven years he occupied the chair of chemistry and toxicology at the University of Louisville, and afterwards succeeded his father at Yale, where he taught his favorite science for thirty years until his death. His numerous contributions to science were mostly published in the "*American Journal of Science and Arts*."

THE AMERICAN JOURNAL OF PHARMACY.

MARCH, 1885.

TINCTURE OF FERRIC CHLORIDE.

BY JOSEPH W. ENGLAND, PH.G.

Read at the Pharmaceutical Meeting, February 17, 1884.

In the ebb and flow of pharmaceutic progress, it is interesting and instructive to note the strange and passing changes in its history; the rise and fall of its many so-called infallible agencies, without whose supposed aid human effort to combat disease was thought fruitless; but time's crucial test of the survival of the fittest has left but few, comparatively, of the many brought forth from nature's hiding-places, and these few have, through their inherent worth and true usefulness in certain morbid physical conditions, not only retained their original hold upon popular favor, but despite the introduction of new fancies with asserted, similar properties, advanced still higher in popular professional opinion and general application. Enrolled among these few there is one, which we will consider, that may be fairly and rightly classed within its ranks as a fit representative; for without question its useful, characteristic qualities have been so long recognized, that no studied words are needed to sound its praise; and that one is Tinctura Ferri Chloridi.

Upon entering this frequently trodden path of pharmaceutical literature, the writer is fully aware of the many able investigations which have preceded his effort; but as accuracy in the statement of fact, irrespective of source, is the main element in the upbuilding of scientific knowledge, any statement or suggestion which promotes that end, enhances the real intrinsic value of the truth already known and paves the way to more profitable exertions in the future. With an earnest desire to seek and grasp the real, underlying features of the subject under consideration, and fully appreciating the high value of previous works in this direction, the subject must necessarily partake, partially at least, of the nature of a review of past and present methods, with an

account of their discrepancies and advantages, and the offering of suggestions for improvements in the light of newly discovered facts.

Our accepted authority¹ of 1850, ordered the preparation of the tincture by saturating a definite quantity of hydrochloric acid with subcarbonate of iron, filtering and making up to the requisite volume with sufficient alcohol. This solution contained, generally, both ferrous and ferric chlorides in varying proportions, and when exposed to atmospheric influences, gradually became oxidized with the deposition of insoluble ferric oxide; no free acid (HCl) being present to prevent the change.

These objections were, in a measure, remedied by the next revision (U. S. P., 1860); but it remained for the following issue (U. S. P., 1870) to divide its manner of making into two separate and distinct changes, which consisted in the introduction of two official products. The first of these was to be known as "*Liquor Ferri Chloridi*," and the second, which was to be made from the first with alcohol, as "*Tinctura Ferri Chloridi*." The Pharmacopœia of 1880 retained these later features, except that in accordance with the general plan of the work, parts by weight were substituted, in the formulæ, for the volumetric measurement of the liquids.

The present pharmacopœial directions for the preparation of the liquor, consist, first, in the formation of ferrous chloride with diluted hydrochloric acid and metallic iron, and then in the oxidation of this ferrous chloride, in slightly acid (HCl) solution, into the ferric state with nitric acid, and the direction to remove any excess of the latter reagent by heat. The tincture is ordered to be made by simple admixture of the liquor and alcohol in definite parts by weight and allowing the mixed liquids to stand in a closed vessel for "not less than three months prior to use." The intent of the latter action, it is said, is to insure the full production of chlorinated ethers.

Mr. R. Rother, through the "*Journal*,"² presents, in a very able and interesting communication, some critical remarks upon "*Ferric Chlorides*" in general and the "*Liquor*" (U. S. P., 1880) and "*Tincture*" (U. S. P., 1880) in particular. He claims, principally, that the present method pursued in preparing the liquor is radically wrong and defective in structure, if its object is to obtain extreme purity of the finished product, through the impossibility of evaporating off the excess of nitric

¹ U. S. Pharmacopœia.

² "*American Journal of Pharmacy*," August, 1884, p. 407.

acid or even nitrogen oxides formed from its decomposition; and that the excess of hydrochloric acid present in the liquor in no way tends toward the etherization of the alcohol in making the tincture, and lastly, that this result, *i. e.*, the etherizing of the alcohol, depends upon the presence of lower oxides of nitrogen arising from decomposed nitric acid.

In regard to the unremoved excess of nitric acid in the liquor, a few remarks confirming the statement of its existence there, are in order. To further this end, the following plan was adopted: To a definite quantity of the official liquor, silver nitrate was added to precipitate all chlorides; care being used to avoid any excess of the precipitant. The filtered liquid, which was strongly acid in its reaction with litmus, readily liberated free iodine on the addition of a very small quantity of potassium iodide. To ascertain whether this acid was nitrous or nitric acid, several volumes of certain diluted acids, equal in quantity to that of the liquor originally used, were each taken separately and exposed to an action, if possible, upon potassium iodide in the same amount as that used above, and the ensuing reaction or non-reaction used as a basis of comparison. When this was done, diluted hydrochloric acid (U. S. P., 1880) had no decomposing effect upon the iodide, neither had diluted nitric acid, so that when the so-called pure nitrous acid of commerce (really a mixture of both nitrous and nitric acids), very largely diluted with water, was added in small amounts and iodine freely liberated, the evidence given clearly showed the presence in the liquor of free nitrous acid alone. The method used is simply a modification of the general test for nitrites in the presence of nitrates, and depends for its value upon the fact that free nitrous acid in dilute solution quickly decomposes potassium iodide with the setting free of its iodine, while free nitric acid, under like conditions, exerts a totally negative influence.

For the moment, let us turn our attention towards certain calculations based upon the official formulæ, showing the amounts of the two acids ordered and that actually required. Since the solution contains 37.8 parts of ferric chloride in each 100 parts, and since it is found that 324.2 parts of ferric chloride require 684.6 parts of 31.9 per cent. hydrochloric acid, then 37.8 parts of ferric chloride, the amount officially desired, would require a less quantity. It is so expressed, and 80 parts, in short, is the result indicating the amount actually used

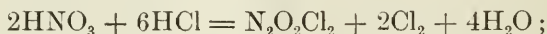
during the process, leaving an excess of 6 parts of officinal hydrochloric acid, thus :

$$324.2 : 37.8 :: (218.4 \div .319 =) 684.6 : 79.82.$$

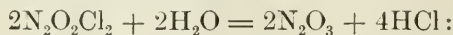
Concerning the nitric acid, we say that, if 972.6 parts of ferric chloride demand for its oxidation from the ferrous state 181.5 parts of 69.4 per cent. nitric acid, then 37.8 parts of ferric chloride would require less, or when found 7.05 parts. The amount of HNO_3 officially ordered is 8 parts, leaving a minimum unused excess of 1 part, thus :

$$972.6 : 37.8 :: (126 \div .694 =) 181.5 : 7.05.$$

Now, as the amount of nitric acid used in the iron valeation is theoretically, and in practice, admittedly in excess of the amount actually demanded for that purpose alone, it is clearly evident, upon examination, that, independently of the facts involved in the valeation, so called, there is another totally separate chemical change taking place, which, apparently, has failed to receive the notice or excite the attention that its high value demands. The real underlying feature of the whole case seems to be that immediately after we have oxidized the iron compound we also change the chemical character of the excess of hydrochloric acid present, in the same manner as we do when making nitrohydrochloric acid, through the presence of the unremoved excess of nitric acid. The reaction is, first :



or, plainly expressed, the change consists, essentially, in the mutual decomposition of both nitric and hydrochloric acids, with the formation of chloronitrous anhydride, $\text{N}_2\text{O}_2\text{Cl}_2$ (a chlorine derivative of nitrous anhydride, (N_2O_3) , or the so-called nitrous acid gas, formed by the simple replacement in the molecule of one bivalent oxygen atom with two univalent chlorine atoms), free chlorine gas and water. The free chlorine is volatilized by heat, the solution being a diluted one; and, since chloronitrous anhydride, $(\text{N}_2\text{O}_2\text{Cl}_2)$, readily decomposes on dilution into nitrous anhydride and free hydrochloric acid, the following secondary change ensues :



or, in other words, the chloro-anhydride is decomposed by water, with the abstraction of its chlorine atoms to form hydrochloric acid with

the hydrogen of the decomposed water, while the freed oxygen atoms of the latter unite with those of the altered anhydride to nitrous anhydride (N_2O_3), which, through its strong affinity for moisture, quickly absorbs one molecule of water to form the more stable nitrous acid (HNO_2).

If, according to the Pharmacopœia,¹ 1 part of nitric acid requires $3\frac{3}{4}$ parts of hydrochloric acid for mutual decomposition in making nitrohydrochloric acid, it is evident that the excess of 6 parts of HCl present in the liquor is only partially changed by the excess of 1 part of HNO_3 , and the remaining $2\frac{1}{4}$ parts of hydrochloric acid must remain free and unchanged, because of the insufficiency of free nitric acid.

Now, in the simple decomposition of the two acids previously mentioned we have a ready solution for the main cause of the production of ethyl nitrite, since it is well known that nitrous acid, or even nitrous anhydride, when brought in contact with alcohol, readily generates that ether.

The claim that the liquor forms nitrohydrochloric acid needs no labored argument to prove, since the presence of free nitrous acid in the commercial liquid has been determined in a number of samples by the author in following the modified test for nitrous acid previously mentioned. The occasional presence of traces of free chlorine has also been observed through the ready solubility of gold leaf in the liquid. In regard to the free chlorine, however, it is fair to assume that it is almost entirely dissipated on the application of heat.

Mr. Rother has constructed a formula for the "Liquor," founded upon the oxidizing properties of chloric acid, resulting from the decomposition of barium chlorate with acid, upon ferrous chloride in acid solution, the barium being precipitated with sulphuric acid.

As a general rule, the reception and permanency of any new pharmaceutical process is, in the main, dependent upon its simplicity of structure and its freedom or non-liability of contaminating impurities arising from defective modes of procedure. There is no doubt that, under exact conditions and in careful hands, this process would give good results; but if, in the making of this product, there is danger, either from the explosive character of the chloric acid formed, or the liability to retain a poisonous impurity in the form of a soluble, unpre-

¹ U. S. P., Acidum Nitrohydrochloricum, p. 18.

precipitated barium salt, in case the precipitant is weaker than the Pharmacopœial strength demanded, its replacement by simpler methods, with safe and equally valuable results, will not be long deferred.

With the submitting of the previously recorded statements, the author would also desire to present a formula for the preparation of the "Liquor," which in his hands has yielded safe and valuable results. The change in working involves no complicated methods, but simply consists, first in the formation of ferrous chloride with metallic iron and diluted hydrochloric acid, as heretofore, and then in the valeation of this ferrous salt, by exposing its heated, acidulated (HCl) solution to the oxidizing action of gaseous chlorine in its passage through the liquid. Any excess of the gaseous element may afterwards be readily removed by the use of heat, or, if so desired, by the passage of a current of air through the solution. The use of chlorine gas, in this connection, as an oxidizer, is only a new application of the old and well-known method of preparing the normal ferric chloride solution employed in chemical analysis where an excess of free acid (HCl) is not wished. On this occasion, however, an excess of HCl is desirable, as a means of insuring permanency of composition.

FORMULA.

Iron, in the form of fine wire, and cut in small pieces, 15 parts ($3\frac{3}{4}$ oz. av.); hydrochloric acid, 59 parts ($14\frac{3}{4}$ oz. av.); chlorine gas, distilled water, each a sufficient quantity to make 100 parts (25 oz. av.). Place the iron wire in a capacious flask, and pour upon it 54 parts ($13\frac{1}{2}$ oz. av.) of hydrochloric acid, previously diluted with 25 parts ($6\frac{1}{4}$ oz. av., or 6 fluidounces) of distilled water. Heat the liquid, slowly, until the reaction is ended, and effervescence ceases; then rapidly heat to the boiling point, filter through paper, and, having rinsed the flask and residue with a little boiling distilled water, pass the washings through the filter. To the filtrate add, immediately, 5 parts ($1\frac{1}{4}$ oz. av.) of hydrochloric acid, followed by the addition of 20 parts (5 oz. av.) of boiling distilled water. Keep the liquid nearly boiling, and pass through it a stream of gaseous chlorine (generated in the usual way), agitating occasionally, until a small portion, tested with freshly prepared test solution of potassium ferricyanide, gives no indication of the existence of a ferrous compound by producing a blue precipitate. Lastly, add, after any free chlorine present has been

removed by heat, sufficient distilled water to make the whole product weigh 100 parts (25 oz. av.).

The "Tincture" may be made, if so desired, by the simple admixture of this new liquor with alcohol in the proportion of 35 parts to 65 parts, as of old, and mixing the liquids; no previous standing before medicinal employment being necessary. But concerning the tincture, more especially the officinal one, there are quite a number of views held regarding its utility and value over a liquor of similar strength, as questionable. The "National Dispensatory," p. 901, in speaking of the liquor (U. S. P., 1880), says of it, that "It is not altered by exposure to sunlight, except in the presence of various organic matters, by which the salt is partially reduced to ferrous chloride" and again, the same authority, under the tincture (U. S. P., 1880), p. 1526, says, that "Notwithstanding this gradual reduction (in the tincture) is well known, the U. S. P. requires the tincture on the addition of freshly prepared solution of potassium ferricyanide, to acquire merely a greenish-brown color, without a trace of blue, which is simply an impossibility." In further corroboration of the reducing action of alcohol and sunlight combined on ferric chloride solution, when prepared by the officinal method, Professor Attfield, in the last edition of his "Chemistry," p. 146, in commenting upon the tincture (U. S. P., 1880), remarks, that "The spirit in the tincture is unnecessary, useless and deleterious; for it acts neither as a special solvent nor as a preservative, the offices usually performed by alcohol and unless the liquid contains excess of acid, decomposes the ferric chloride and causes the formation of an insoluble oxychloride of iron. Even if the tincture be acid it slowly loses color; ferrous chloride and chlorinated etherial bodies being formed. A liquor of similar strength is doubtless destined to displace the tincture altogether." Further evidence in conformation of these views, is given by Mr. R. Rother in his paper on "Ferric Chlorides"¹ to which previous reference has been made, when he says, that "In regard to the officinal proportion of alcohol in the tincture, it may be said that it is unnecessarily great. Whilst a moderate amount, say 35 per cent., may be beneficial, any large excess may be fairly judged as a species of impurity, aside from being a positive waste." Now the evidence adduced from these extracts and also from the remarks previously made is, that the prepara-

¹ "American Journal of Pharmacy," August, 1884, p. 409.

tion of the official tincture, and its employment, was radically wrong if a strictly definite standard solution of the chemical was desired, and there is only one feature in its use, that could be construed as favorable evidence toward its continuance and that is, that the formation of nitrous ether in the old tincture may have had more or less to do therapeutically with its peculiar diuretic action on the human system, but this fact need not stand in the way, for the simple reason that if such belief is a true one, a more definite quantity of spirit of nitrous ether (U. S. P., 1880), may be prescribed in its place with a new liquor, than was possible to obtain in the old tincture. With a new liquor, a formula might be constructed with spirit as of old, and it would possibly remain unchanged, but that fact does not nullify the pertinency of the statement, that the employment of alcohol is both unnecessary and useless, and, serving as it does no special good, its use may be justly condemned as a positive waste.

The better way, it would seem, in order to secure the fittest representative of the article in question, would be to receive the suggestion of a diluted liquor and advocate its adoption by the Pharmacopœial Committee of Revision in its next session; that method of adoption consisting in the recognition of one new "*Liquor Ferri Chloridi*," having the same iron strength as our present tincture, and also adding, if wished, 5 per cent. of the official spirit of nitrous ether in lieu of ethyl nitrite; and the total discarding of the present "*liquor*" and "*tincture*" as both useless and unnecessary. In this way all error and possible confusion, incidental to the changes, could be overcome, and the general usefulness of the chloride continued in active force.

Samples of the several liquids previously referred to are presented. The first one is the official liquor—a 37·8 per cent. solution of ferric chloride. It is a deep reddish-brown liquid, having an acid strongly styptic taste and an acid reaction. The second is a tincture, U. S. P. strength. It is a yellowish-brown liquid, destitute of ethereal odor, possessing an astringent styptic taste and an acid reaction. The third is a diluted liquor of tincture strength. It is a bright yellowish liquid, acid in reaction and of styptic taste. The fourth is a diluted liquor, tincture strength, containing 5 per cent. of spirit of nitrous ether (U. S. P., 1880), which has been added to it in the cold. A dark reddish-brown liquid of ethereal odor, which on standing, eventually, becomes of lighter color. Properties, the same in general, as the preceding liquids. The fifth and last is a diluted liquor, in which the 5 per

cent. of added spirit of nitrous ether, has been slowly poured into a boiling solution of ferric chloride and then diluted to the proper quantity of liquid.

In closing it may be well to make some remarks of the peculiar action exercised by nitrous acid, or certain of its derivatives upon solutions of ferric chloride prepared by the chlorine process. When the diluted liquor with 5 per cent. of spirit of nitrous ether was prepared, an immediate darkening of the liquid was noticed, which, upon the application of heat, assumed a much lighter shade. A possible theory of the cause of this darkening in color is that a ferric nitrite may be formed from the added nitrous compound, which, upon heating, is decomposed by the free hydrochloric acid present, with the formation of free nitrous acid and ferric chloride.

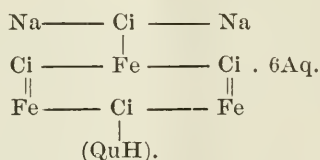
CITRATE OF IRON AND QUININE.

BY R. ROTHER.

According to the Pharmacopœia the official trihydrous quinine loses two ms. of water at 100°C , and the remaining third m. at 125°C . If this be so the quinine dried at the former temperature cannot be the anhydrous alkaloid. Yet in the formula for citrate of iron and quinine it is implied that this is the case. The writer, however, doubts this, and hence assumes that this compound contains 12 per cent. of monohydrous quinine, which would give the substance, chemically considered, a molecular weight of 2,850. This will indicate one m. of quinine monohydrate to about 9.22 ms. of ferric citrate. It is then probably an indefinite mixture of ferric hydrocitrate, ferric citrate and an undetermined quinio-ferric citrate held in some kind of chemical union by the two former salts. A plausible analogy for this view is found in what may be termed an acid ferric citrate. When one m. of ferric citrate or 2.72 grammes is mixed with one m. of citric acid, or 2.10 grammes, then heated with some water until dissolved, finally evaporated and dried at a gentle heat, a product weighing 4.91 grammes is obtained. This result shows that a definite compound is formed having the formula $\text{FeCi.H}_3\text{Ci.3Aq.}$, with a molecular weight of 491. The salt is extremely soluble but non-deliquescent. Its color is of a lighter tint than ferric citrate. It becomes soft on heating, and although friable when cold, it is too tenacious for scaling. By replacing all the basic hydrogen with sodium or other bases, very characteristic

green colored double salts are formed ("American Journal Pharmacy," March, 1883).

In the paper referred to a triquinic substitution was noted. When but two or only one replacement is made the resinous and insoluble nature becomes successively less pronounced. The interposition of sodium modifies these features still further, so that when two sodic and one quinic radicle are present a compound of considerable infusibility and solubility results. When at this stage the ferric citrate is doubled the solubility is again greatly enhanced. But the tripling of the ferric citrate touches the climax in an unlimited capacity for solution. The double salt thereby obtained is however perfectly nondeliquescent. It has a fine apple green tint, and is readily procured in magnificent and permanent scales. Although promptly and profusely soluble in cold or hot water, it is but sparingly soluble in alcohol. It is also an invariably definite compound. For when in preparing it three ms., or 8.16 grams of ferric citrate, one m., or 2.10 grams of citric acid, two ms., or 1.68 grams of sodium bicarbonate, and one m., or 3.78 grams of trihydrous quinine are united in the presence of water, evaporated and then dried at a gentle heat, a product weighing 14.03 grams is obtained. This result indicates that the molecular weight of this new salt is 1,403, and that its empirical formula is $3(\text{FeCi}).\text{Na}_2(\text{QuH})\text{Ci}.6\text{Aq.}$, and its structural formula



Contrasted in this expression the proportion of quinine seems insignificant. Compared however by weight, it is as 378 to 1,403, that is the salt contains 27 per cent. of trihydrous quinine.

The corresponding potassium salt is equally elegant and soluble. When 8.16 grams of ferric citrate, 2.10 grams of citric acid, 2.00 grams of potassium bicarbonate, and 3.78 grams of trihydrous quinine are united as in case of the sodium salt, the product weighs 13.81 grams. This result shows that the composition of the salt is $3(\text{FeCi}).\text{K}_2(\text{QuH})\text{Ci}.3\text{Aq.}$, and its molecular weight 1,381. Accordingly the percentage of quinine trihydrate is about 27.4, which corresponds to nearly 31.3 per cent. of quininum sulphate.

An analogous sodium salt is produced when the quinine is replaced

by an additional sodic radicle. In appearance it differs only in having a deeper shade of apple green. It is equally soluble, nondeliquescent, and superbly scaled. Its definite character is shown that when three ms., or 8.16 grams of ferric citrate, one m., or 2.10 grams of citric acid and three ms., or 2.52 grams of sodium bicarbonate are mixed in the presence of water heated until combined, and then evaporated and dried at a gentle heat, a product is obtained weighing 11.01 grams. From this it appears that the formula of the salt is $3(\text{FeCi}).\text{Na}_3\text{Ci}.6\text{Aq.}$, and the molecular weight 1,101. It commends itself as a substitute for the now official ammonio-ferric citrate, over which it has various advantages.

Owing to the fact that in the construction of the new citrate of iron and quinium a quinium citrate would be in some respects superior to the alkaloid it became desirable to ascertain the composition of the three citrates, containing, respectively three, two and one quinic radicles.

The first one was therefore determined by uniting 3.78 grams of trihydrous quinine and .70 grams of citric acid in contact with water, then evaporating and drying it at a gentle heat until the residue ceased to lose weight. The product weighed 4.96 grams, showing that the molecular weight is 1,488, and the formula $(\text{QuH})_3\text{Ci}.18\text{Aq.}$

The second or diquinic citrate is obtained when 3.78 grams of trihydrous quinine and 1.05 grams of citric acid are united as in the first instance. The product weighs 4.65 grams. This result indicates that the formula of the salt is $(\text{QuH})_2\text{HCi}.5\text{Aq.}$, and the molecular weight 930. In regard to appearance and solubility this salt closely simulates the triquinic citrate.

The third was found by a similar method to give from 3.78 grams of trihydrous quinine and 2.10 grams of citric acid a residue weighing 5.70 grams. Its molecular weight is therefore 570 and its formula $(\text{QuH})\text{H}_2\text{Ci}.3\text{Aq.}$

When 3.78 grams of quinine trihydrite and 1.40 grams of citric acid are combined as in the three preceding cases the product weighs 5.12 grams. This result shows that the formula of the salt thus obtained is $(\text{QuH})_3\text{H}_3\text{Ci}_2.10\text{Aq.}$, and that its molecular weight is 1536. It is more crystalline and soluble than the first two of the preceding citrates, and less so than the third. This compound is not a mixture, but apparently a combination between a monoquinic citrate and a diquinic citrate molecule. But it is simpler to regard it as a combination

between a triquinic citrate and a citric acid molecule. This view would consider it a super acid quinium citrate. However, according to either construction, the union partakes of that subvalent nature wherein the chemical compact cannot be represented by unit bonds.

The first of these citrates is the least soluble of them and forms as a voluminous curdy mass.

The second has a more crystalline character and is also slightly more soluble.

The third crystallizes in voluminous collections of delicate satiny needles. It is by far the most soluble of these salts, imparting a very decided bluish fluorescence to the cold aqueous solution, and is much more freely soluble in hot water. Although this monoquinic citrate appears to be more soluble than the ordinary sulphate, it is remarkably less bitter. Besides the process already mentioned, it can also be prepared by double decomposition between 436 parts of diquinic sulphate and monosodic citrate derived from 210 parts of citric acid and 84 parts of sodium bicarbonate. The resulting magma is heated with sufficient water to dissolve it, and the solution set aside to crystallize. This method is, however, somewhat wasteful, owing to the marked solubility of this salt.

The monoquinic citrate is apparently the most practically applicable salt in the preparation of the new sodio-ferric quinium citrate. If not procurable as such in the market, it can be readily compounded by directly uniting the quinine and citric acid employed in the working formula of the double salt. As already intimated, the union is more speedily and easily effected by this manner of compounding than by the incorporation of the quinine last. The tendency of the alkaloid to fuse into resinous masses is, in the case of the new salt, by no means as pronounced as in the old official process, yet it can be wholly obviated as above suggested.

If the Pharmacopœia intends to employ anhydrous quinine in its formulas, it should not have adopted a hydrate at all. Had an anhydrite been directed, the operator would either have employed the trihydrous quinine in the proportion of 378 to 324 or he would have appropriately heated 378 parts of the trihydrate until only 324 parts remained.

The preparation of a pure trihydrous quinine is not so easy as it might seem. It is especially difficult when the sulphate is used. On pouring the solution of the acid sulphate into the alkaline precipitant

never so carefully, a portion of the sparingly soluble ordinary sulphate will always be entangled in the precipitated quinine. A perfect decomposition can only be effected by percolating a weak alkaline liquor through the collected magma until the filtrate no longer responds to ammonia. Contamination with precipitated quinium salts can, however, be obviated directly by employing quinium chloride in saturated cold solution. Since ordinarily a much larger proportion of alkali is needed to precipitate the quinine wholly, than simple equivalents, it follows that ammonia is not a desirable precipitant. Fixed caustic alkalis and disodic carbonate are preferable, as an excess dissolves no quinine, which happens in case of ammonia.

If heat were admissible the precipitation of quinine could be more easily performed. However by taking advantage of the fusibility of trihydrous quinine, a process is derived which renders this property for the production of anhydrous quinine very practicable. On depriving fused trihydrous quinine of its water by means of a properly regulated heat, a very friable residue of anhydrous quinine is left. Hence anhydrous quinine, in an appropriate official form, can be produced by heating together 8.72 grams or one m. of ordinary quinium sulphate, 5.72 grams or two ms. of disodic carbonate and about 50.00 cc. of water, until perfect decomposition of the sulphate is effected. On cooling, the alkaline solution is decanted from the hardened mass. This is well rinsed with cold water and then successively digested with small portions of water until the fused quinine is thoroughly washed. The mass is now heated at a properly regulated temperature until a friable residue of anhydrous quinine, weighing nearly 6.48 grams, remains.

From these various considerations, the following formula for the new sodio-ferric quinium citrate is derived:

Ferric citrate.....	8.16 grams
Citric acid.....	2.10 "
Sodium bicarbonate.....	1.68 "
Quinine trihydrate.....	3.78 "
or,	
Quinine anhydrite	3.24 "
Water, sufficient.	

Place the ferric citrate, sodium bicarbonate and 20.00 cc. of water into a porcelain capsule of convenient size, and apply heat, constantly stirring the mixture until perfect solution has resulted. Now place the quinine, citric acid and 20.00 cc. of water into a similar capsule,

and apply heat whilst stirring the mixture, until the combination is completed. Pour the solution into this magma, apply heat, and when all has dissolved, evaporate the solution at a moderate temperature, to a syrupy consistence, and spread it on glass plates to dry in the warm open air, so that the salt may form in scales.

THE DIASTATIC POWER OF CERTAIN EXTRACTS OF MALT.

BY ALBERT B. PRESCOTT.

In determining the starch-converting power of certain samples of extract of malt of the market, these samples having been obtained since December 1, 1884, from different retail drug stores in different towns in the interior of Michigan, with one sample of each brand obtained in Chicago, Illinois, I have obtained the following given results:

"MALTINE" OF THE MALTINE MANUFACTURING COMPANY.

No. 1	converts 9 to 10 parts starch.
No. 2	" 8 "
No. 3	" 9 to 10 "
No. 4	" 8 "
No. 5	" 14 "
No. 6	" 8 "
No. 7	" 13 "
Average	10 to 11 parts starch.

"TROMMER'S EXTRACT OF MALT.

No. 1	converts 18 parts starch.
No. 2	" 16 "
No. 3	" 17 "
No. 4	" 16 "
Average,	16 $\frac{3}{4}$ "

The starch was weighed as dry starch, and rated in parts to one part of the malt extract. The concentration, one part of starch to twenty parts of water, and one part of malt extract diluted with water to four parts. The time of digestion, twenty minutes; the temperature, 60° to 64° C. The end-reaction, an extinction of the iodine and starch color in three minutes after the intermixture of the iodine with the digested starch (previously cooled).

One year ago, using the same method and conditions, I tested the starch-converting power of samples of "Maltine" and of "Trommer's Extract of Malt" obtained (in open market) in Ann Arbor only, and then found and reported that the "Maltine" converted 33 parts of starch, and the "Trommer's Extract of Malt" converted 16 parts of starch. And testing now again my retained samples obtained a year

ago, I find their converting power not changed, and my test results the same reported in January, 1884.

From the investigation now made, I am convinced that, as now furnished in Michigan, "Trommer's Extract of Malt" holds a nearly uniform power of converting 16 to 17 parts of starch, and that "Maltine" has a more variable power of converting a mean of 10 to 11 parts of starch. And I am convinced that the samples of "Maltine" I obtained in Ann Arbor, a year ago, were exceptional samples, as they had three times the starch-converting power possessed by the average "Maltine" of the Maltine Manufacturing Company supplied in Michigan for the past three months.

ANN ARBOR, MICHIGAN, January 6, 1885.

AN EXAMINATION OF BURDOCK FRUIT.

A CONTRIBUTION FROM THE CHEMICAL LABORATORY OF THE PHILADELPHIA COLLEGE OF PHARMACY.

BY HENRY TRIMBLE AND F. D. MACFARLAND.

Read at the Pharmaceutical Meeting, February 17, 1885.

The following analysis of the fruit of *Lappa officinalis*, while incomplete, gives, we believe, the important constituents of this drug. The moisture determined in the usual way was found to be 7.30 per cent., and the ash 5.34 per cent.

Ten grams reduced to No. 60 powder were thoroughly exhausted with petroleum spirit. This solution, on evaporation and heating to 110°C., was found to consist of a bland light yellow fixed oil, representing 15.4 per cent. of the fruit.

The following are some of the important characteristic reactions. With fuming nitric acid a brown color and aromatic odor, but not becoming solid. With strong sulphuric acid a brown color, becoming thick and syrupy. Exposed to the air in thin layers the oil solidifies. Alcohol and absolute alcohol do not dissolve it, but hot absolute alcohol, ether, chloroform and benzol are good solvents. The specific gravity is .930, determined with a larger amount of the oil prepared from 75 grams of the drug. That portion of the original ten grams remaining after treatment with petroleum spirit was exhausted with ether which dissolved 1.15 per cent. of a resin soluble in alcohol. Absolute alcohol extracted from the remainder of the drug 12.6 per

cent. 8.3 per cent. being insoluble in water, appeared to be resin soluble in dilute alcohol; the remaining 4.3 per cent. were soluble in water and were examined for alkaloids. A small quantity of crystals separated on evaporating the chloroform solution of this aqueous portion, first made alkaline with potassium hydrate. The amount, however, was so small that the 75 grams of the drug remaining after extracting the oil with petroleum spirit were exhausted with dilute alcohol, the alcohol evaporated, and the residue, after rendering alkaline, was shaken repeatedly with chloroform until that solvent contained all the bitter principle. On evaporating the chloroform a residue was obtained which all efforts, so far, have failed to get in a crystalline condition. It is intensely bitter, of a faintly alkaline reaction, gives precipitates with phosphomolybdic acid, Mayer's test, tannic acid, and gives off ammonia on heating with potassium hydrate. It is therefore quite certain that this bitter principle is an alkaloid, and we suggest for it the name of *Lappine*.

The other constituents were not determined, but they with the bitter principle will be further investigated.

We were induced to make this analysis from an account of the medicinal value of the so-called burdock seed in Dr. Squibb's "Ephemeris," vol. i, page 115.

PHILADELPHIA, Feb. 17, 1885.

Production of Sulphate of Quinine in Europe.—The note under this heading which was published on page 27 of the January number has been corrected, some time ago, in the "American Oil and Drug Reporter," as far as it relates to the production of the factory of Fried. Jobst, Stuttgart; and I now desire to add that this quinine factory, which for many years has been under my special direction, does not, as stated in the note referred to, produce 20 kilos daily, but considerably more—about three times the quantity reported, as may be discerned from the fact that at the European-American Quinine Convention of the past year the establishment of Fr. Jobst ranged among the four largest quinine factories of Europe. Furthermore, the note referred to requires a correction, since at present the relations upon this field are completely altered, the leader of the figures given on page 27, the *Fabbrica lombarda*, having retired from the scene of activity.

O. HESSE.

SUBSTANCES CONTAINED IN SAFFRON.

BY R. KAYSER.

Bouillon, Vogel, Quadrat, Rochleder and Mayer, and Weiss have at various times worked at this subject, but the information at present available is unsatisfactory. The author has therefore carefully investigated a sample of saffron, *Crocus electus Gatinais*.

Essential Oil of Saffron.—This was obtained from saffron by steam distillation in a current of carbonic anhydride. It is an almost colorless mobile liquid, with an intense odor of saffron. When exposed to the air, it becomes oxidised and turns brown and syrupy. Analysis showed its composition to be $C_{10}H_{16}$, so that it belongs to the class of terpenes.

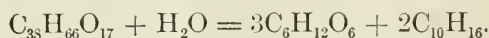
Crocin.—Saffron was first freed from fatty matters, etc., by ether and then extracted with water at the ordinary temperature. The aqueous solution was shaken up with bone-charcoal, which absorbed nearly all the coloring matter. The charcoal was filtered off, and the crocin extracted from it by washing with pure water. This solution was evaporated to dryness, and the residue treated with 90 per cent. alcohol. On evaporating the alcoholic solution, a yellowish-brown brittle mass is left, which yields a yellow powder. Crocin is easily soluble in water and dilute alcohol, less so in absolute alcohol, and almost insoluble in ether. Strong sulphuric acid dissolves it to a deep blue solution, which turns first violet, then cherry-red, and lastly brown. Nitric acid (sp. gr. 1.4) gives a similarly colored solution, but the color immediately changes to brown. Hydrochloric acid yields a yellow solution. Lead acetate, and lime- and baryta-water give no precipitate, but, on heating, they decompose crocin into crocetin and a sugar. Alkalis cause the same decomposition in the cold. Crocin is thus a glucoside, and analysis shows its composition to be $C_{44}H_{70}O_{28}$.

Crocetin is best obtained by the action of hydrochloric acid on crocin. It is precipitated in the form of yellow flocks, which when dried yield a red powder. It is almost insoluble in pure water, but is rendered soluble by the addition of a small quantity of an alkali. Acids reprecipitate it from such solutions in orange flocks. It is easily soluble in alcohol. An alcoholic solution gives bright red precipitates with lead acetate, and with lime- or baryta-water; the compounds so formed, however, are not definite, but vary in composition. Sulphuric and hydrochloric acids behave with it as with crocin. Its composition

is $C_{34}H_{46}O_9$. The decomposition appears to take place according to the equation $2C_{44}H_{70}O_{28} + 7H_2O = C_{34}H_{46}O_9 + 9C_6H_{12}O_6$.

Crocose.—The sugar mentioned above yields rhombic crystals. Its solution has a sweet taste and strong dextrorotatory action. Its reducing power for Fehling's solution is only half that of dextrose. The quantities of crocetin and crocose obtained by the decomposition agree very closely with those required by the above equation.

Picrocrocin.—*Saffron-bitter*.—This substance crystallizes out in the ether-extracting apparatus if the extraction be continued for a long time. It forms colorless prismatic needles, very sparingly soluble in ether. It dissolves easily in water and alcohol, less so in chloroform. It has a characteristic bitter taste, which is very persistent. It melts at 75° to a colorless liquid. Its formula is $C_{38}H_{66}O_{17}$. Lead acetate, lime-water and baryta-water give no precipitate in the cold, but decomposition takes place on warming, crocose and the terpene described above being formed. Picrocrocin is thus a glucoside like crocin, and the decomposition may be expressed by the equation—



—*Jour. Chem. Soc.*, 1885, p. 59; *Berichte*, 1884, pp. 2228–2234.

So-called Carbonate of Titanium.—In a paper read before the Detroit Academy of Medicine, and published in "*Jour. Am. Med. Assoc.*," November 29, 1884, Dr. A. B. Lyons communicates the analysis of a sample of this new pretended remedy, which consisted of

Ferrous sulphate (cryst.).....	54.8
Ferric oxide (anhydrous).....	40.5
Salts of calcium, potassium and sodium.....	2.2
Titanic acid and silica.....	1.0
Organic matter and loss.....	1.5
	<hr/>
	100.0

The organic matter contained a vegetable alkaloid which proved to be sanguinarine. Practically, the powder consisted of a mixture of nearly equal parts of sub-carbonate of iron and sulphate of iron, partially exsiccated, with addition of an insignificant quantity of blood-root. (See also "*Am. Jour. Phar.*," 1884, p. 648.)

THE ESSENTIAL OIL INDUSTRY IN GRASSE.¹

BY F. A. FLUCKIGER.

The world-wide fame of Grasse depends upon the essential oils of plants which there grow wild or are cultivated. Among the former may be named:—(1) *Lavandula Spica*, Chaix (*L. latifolia*, Villars), the “aspic” of the French, which occurs plentifully in the country all around Grasse, and even quite close to the city. (2) *Lavandula vera*, DC. (*L. officinalis*, Chaix, *L. angustifolia*, Moench), which not only grows together with *L. latifolia*, but more frequently on high ground in the mountain region; generally *L. vera* is a much more widely spread plant throughout the Mediterranean region, and is also easily cultivated throughout Europe. Both these plants have stout woody stems, which are very enduring; those of thyme are still more vigorous. (3) *Thymus vulgaris*, L., a real ornament of the Mediterranean region, where it is found plentifully both in the Grasse district—not making its way so high up the mountains, but growing in the light thickets—and on unsheltered coast. (4) *Rosmarinus officinalis*, L., the erect but always bent stems of which, reaching a height of two metres, and often several centimetres thick, probably overtop most other labiates, or, at any rate, are not equalled in any other European species of this family. At Mentone and Nice it is difficult to say whether *Thymus vulgaris* or *Rosmarinus* grows most abundantly. At Grasse the latter manifestly loses ground, notwithstanding that it is by far more conspicuous than the lower lying thyme. Here and there *Cuscuta* (*Epithymum*?) selects the rosemary stalks for its home.

The oil of these four labiates constitute an important export industry of Grasse. The plants being vigorous, persistent bushes, they require no cultivation, as the tops, bearing leaves and flowers, taken for distillation, are always replaced, even though the collector does his work in a most unskilful manner. The large distilleries in Grasse conclude arrangements with the communities in the districts round about, by which they become entitled to the produce of large tracts of land. The work itself is done for the Grasse firms by the rural population, who set up their simple copper stills on the spot and only carry the distillate to the city. Many of these traveling stills (*alambics voyageants*) are indeed the property of the large houses in Grasse. Probably the work has long been carried on in this way. The Parisian druggist,

¹ Abstract from a paper in the *Archiv der Pharmacie*, xxii., 473.

Pierre Pomet, who was well informed in such objects, said in 1694, in his "Historie Générale des Drogues," concerning *Lavandula Spica*, "elle est si commune dans le Languedoc et en Provence . . . qu'elle ne coûte qu'à prendre," and he drew from this country the essential oils in question. That the oils are obtained in the manner indicated very cheaply is very probable, but it is a question whether a systematic cultivation and an economical manufacture would not induce greater progress. According to estimates for which the author is indebted to the kindness of M. Roure, proprietor of one of the largest manufactories, the following quantities of each oil are delivered in Grasse every year: from *Lavandula vera*, 80,000 to 100,000 kilograms; from *Thymus vulgaris*, 40,000; from *Lavandula Spica*, 20,000 to 25,000; from rosemary an equal quantity. The quantity sent out from Grasse probably covers the requirements of the whole world; at least the author only knows of rosemary that it is cultivated also in Dalmatia, which country sends about 20,000 kilos. of the essential oil into the market.

Oil of thyme furnished the first materials, in 1847 and 1853, for the investigation of thymol, but this substance is no longer prepared from it. The amount of thymol in the oil appears to vary considerably, and more exact information on this point is desirable.

Of the oils which, unlike those already mentioned, are regularly distilled in the laboratories of the Grasse manufactories, those of species of *Citrus* must be named, and especially oil of neroli. The flowers of the bigarade tree (*Citrus vulgaris*, Risso) are not submitted to distillation for the oil, of which they yield at most one part from one thousand parts, but for the production of the thousands of hectolitres of "eau de fleurs d'oranger," "aqua florum aurantii," and "aqua naphæ," upon which Grasse prides itself; the oil of neroli is a bye-product, though of course very costly. According to the author's informants, about 2,000 kilograms of this beautiful oil is prepared in Grasse yearly, but nominally much more is exported. When a proper price is paid a pure oil of neroli may be obtained; but the perfumers and druggists require it at reduced prices. In order, therefore, to accommodate them the producers add some "essence de petit grain," which, however, is no longer distilled from "petit grain," *i. e.*, the small unripe fruit of the bigarade tree, but from its leaves. No other species or form, however, of the genus *Citrus* is endowed with so fine an aroma in the leaves, as the bitter-fruited orange tree, the "bigaradier." The blos-

soms of the ordinary sweet-fruited orange, which are not used for distillation, yield only an oil of inferior value. In competition with the products of the bigaradier, the sweet orange which is cultivated in Grasse is disappearing. Neither the bergamot nor the lemon occur there.

At the time of the author's visit the enormous metal tanks and cemented cisterns for holding rose water in the factory of M. Roure were ready for the reception of the products of the coming season, which, like that of the neroli flowers, is at its height in the month of May, when thousands of kilograms of rose leaves are passed daily into the stills. The rose oil collected in small quantity during the distillation of the rose water is probably equally as fine as the oil of roses from the Balkans or from India; but notwithstanding it grows in nearly the same geographical latitude, the rose in Provence produces far more of the worthless solid constituent, dissolved in the liquid portion, which alone is odorous. The question arises whether a change in the strain of the roses so largely cultivated in Grasse might not lead to an improvement in respect to the oil. However, the rose water has for a century found a good sale, so that Grasse is not under the necessity to seek for further progress. The oil at present obtained in the manufacture, amounts to about one kilogram from each 12,000 kilograms of fresh rose leaves; to completely satisfy the requirements of customers, oil is obtained from the Balkans. The author thinks that the manufacture in Grasse affords a favorable opportunity to determine the chemical properties, hitherto completely unknown, of the oil to which the rose owes its perfume.

In perfumery "benre d'iris" justly enjoys great popularity. It is distinguished above many other perfumes by an agreeable softness and great permanence. With the help of the most perfect methods of distillation, iris root yields scarcely one part per thousand of the so-called "orris-root camphor." The above named house in Grasse prepares four to ten kilograms yearly. Probably an equal quantity is distilled in London and in Leipzig. A specimen of orris butter presented by M. Roure to the author enabled him to make a comparison of it with preparations from the two other sources.¹ In the case of orris butter also we have to do with an oil, entirely uninvestigated as to its composition, occurring in minute quantity together with the odorless prin-

² See Flückiger's "Pharmacognosie," p. 314.

cipal constituent, in this case myristic acid. In Grasse "beurre d'iris" is valued at 1,500 to 1,800 francs the kilo. It is noteworthy that the local manufacturers draw their supplies of raw material from Florence and Verona, whilst there cannot be the remotest doubt that *Iris germanica* and other species of *Iris* flourish equally as well on the mountains and hills of Basse-Provence as in the fields of Tuscany or at Verona. In this case, however, also there is no necessity to give up the old custom, which is indeed carried so far that in no case is the *Iris germanica*, abundant in the district, made use of.

Besides the wholesale distillation of orange flowers and roses, some other aromatic plants are occasionally worked up when required, though not to any very great extent. But another source of considerable revenue is the manufacture of "pommades" and "extracts." In this extensive branch of industry the essential oil is utilized from flowers containing it only in very small quantity. Among these are (1) the bigarade orange flowers, and (2) roses. In the following the essential oil is present in so minute a quantity that it is scarcely practicable to obtain it by distillation.

(3). *Cassie*.—This is the name given by the French to the elegant yellow flower-heads of the *Acacia Farnesiana*, Willd., a small tree which first reached the Farnese gardens at Rome from the West Indies and Central America. The fine odor of the flowers brought about its introduction into Provence, which it appears did not take place, at least for industrial purposes, until 1825.¹ At present "cassie," is cultivated very carefully and on a large scale throughout the entire district between Canne and Grasse. The plantations are usually the property of the manufacturers or other landed proprietors and are worked by lessees, the terms being the simple and primitive arrangement of sharing the proceeds with the proprietors. This system extends in this country to other perfumery plants, as well as to the olive.

(4). *Jasmin*.—The fields near Grasse are generally planted with *Jasminum officinale*, L., which was probably first brought to Italy from

¹ "Apportées en France vers l'année, 1825" (Guib. Hist. Dr. iii, 1869), 396. Ricord-Madiana, as well as Bonastre, attempted in 1830 and 1831 the chemical investigation of the flowers of the West Indian *Acacia Farnesiana*, though without any result worth mentioning (*Journ. Pharm.*, xvi, 571; xvii, 419). In the East Indies a gum exuding from the stem of the plant is collected. The root bark is said to have a very strong garlic-like odor; it therefore probably contains an allyl compound. (Flückiger, *Pharm.* (hemie, 1879, p. 65.)

Asia Minor or India in the sixteenth century ; but it is found advantageous to graft upon it the *Jasminum grandiflorum*, L., bearing larger flowers, having a more powerful odor; this also is an Indian species, which probably came to Europe before the time of Rheede, in whose 'Hortus Malabaricus' (v., tab. 52) it is figured. But the *Jasminum grandiflorum*, here known as "Jasmin d'Espagne," even in the beautiful Paradise of Provence, requires some shelter in winter, and this is effected by simply covering the small bushes with earth. Since only the flowers are required, the plants are allowed to grow scarcely half a metre high, and they are planted close to one another in regular rows. In the spring the young shoots are cut back. The flowering takes place in August. Professor Flückiger suggests that an enterprising cultivator might make experiments at Grasse with the *Jasminum Sambac*, Vahl, which in India is far more highly prized and appears to possess a perfume far more powerful than that of any other species of jasmine, as was pointed out two hundred years ago by Rumphius. A figure of *Jasminum Sambac* is given in the *Botanical Magazine*, vol. xliii. (1816) No. 1785.

(5). *The jonquille* (*Narcissus Jonquilla*, L.), probably of oriental origin, bears two to five extremely odorous yellow flowers, with a short funnel-shaped perianth and a corona four times as long. The name of the species (Italian, *giunchiglia*) is derived from the nearly cylindrical leaves, grooved on their upper side, recalling those of species of *Juncus*. When the author was in Grasse, in April, the flowering of the jonquil was already over.

(6). *Réséda* (*Reseda odorata*), cultivated throughout Central Europe as a favorite garden and pot plant; it is alleged to have been derived from Egypt.

(7). *Tubéreuse* (*Polianthes tuberosa*, L.) an Amaryllidaceous plant, belonging to the Agave division, and a native of Mexico. Its beautiful white flowers give its name to the genus (*polios*, white or grey); the single species has a short tuberculous thickened rhizome. The *Polianthes* was introduced in Europe during last century as an ornamental plant on account of its noble head of odorous flowers, which probably are nowhere else cultivated in such quantity as at Grasse. Already, between 1571 and 1577 it had attracted the attention of the Spanish physician Francisco Hernandez, who undertook the scientific exploration of Mexico at the cost of King Philip. In his "Nova Plantarum, Animalium et Mineralium Mexicanorum Historia" (Rome

1651, p. 27), the indefatigable physician gives a modest but unmistakable figure, with a corresponding description of the beautiful plant, under the name "Omizochitl, seu Flos osseus." He also mentions its use in making odorous wreaths. Upon this point the scanty notice which Clusius gives in 1601 of the "*hyacinthus indicus tuberosa radice*" in the '*Rariorum Plantarum Historia*' is silent. Clusius' figure is not so faithful as the one previously mentioned. Since the time of Clusius the name *tuberosa* has clung to the plant.

(8). *Violette*.—The *Viola odorata* is not grown in the open field, like the other perfumery plants, but in the olive groves, which here extend over hill and valley in special beauty. The Riviera can show far larger and wider spreading olive trees, but those in the neighborhood of Grasse are remarkable for their fresher and greener foliage. Besides this, the ground shaded by the trees is there richly overgrown with grass, so that the color of the landscape recalls the loveliness of the hills near Florence. With such surroundings, the violet plantations spread out here and there, both in the immediate neighborhood of Grasse and on higher slopes, present a charming appearance. Occasionally the *Sarothamnus* is associated with it also. At the time of the author's visit he saw at the factory a large sack of the last violets of the season, which had been delivered fresh by the collectors only an hour before. The flower was the ordinary *Viola odorata*, neither darker nor brighter in color, nor possessing a stronger perfume. But he was told that "*les dernières de la saison*" had a decidedly weaker odor, and he heard also that the collectors were dissuaded from bringing any more.

A great part of the industry and trade of Grasse is dependent upon the foregoing eight plants and it does not suffer from fluctuations due to change of fashion like many other industries. Year after year the manufacturers supply to their customers the same favorite "pommades" and "extracts," and it is noteworthy that no perfumer from the large centres of fashion should direct his attention to other preparations of the kind. The explanation may be that the introduction of novelties into this domain requires an acquaintance with the vegetable kingdom which is scarcely possessed by the purchasers of the pommades and extracts of Grasse.

The "pommades" are prepared by two methods, "infusion" and "enfleurage." In the former the transfer of the odorous principles to fat is brought about by intimate contact and warming. The predilec-

tion of the human family for unguents may not be easy to explain, but probably it goes back to the highest antiquity. Pliny ascribes their discovery to the Persians, and Pliny, Dioscorides, and other old writers refer in great detail to these preparations. In the present day pharmacy seeks not so much to convey to fat the agreeable odor of flowers as the healing properties of particular plants.

Dioscorides gives quite a detailed introduction to the purification of the fat for the purpose, and the preparation of this basis of pommades in the best condition is still the first endeavor of the manufacturers in Grasse. The best pig's lard or beef suet is selected, a considerable portion being contributed by the populous towns of the Riviera, as well as Lombardy. The melting of the fat, its mechanical purification and washing, are conducted with exemplary care and cleanliness. The digestion of fat with benzoin has long been carried on in Grasse on the largest scale, furnishing an incontestable opportunity of demonstrating its effectiveness; and the fact that the stability of fat is essentially increased by the process admits of no doubt. Lard and beef tallow, either separate or mixed in the proportion of 2:1, are kept until required for use in tinned iron vats, in fine dry ventilated cellars. The "infusion" is effected in large jacketed boilers, in which the fat is warmed by steam heat, and the flowers are added. In the month of May over 10,000 kilograms of rose or bigarade flowers pass daily, for many days in succession, into the boilers of the factory of Roure-Bertrand fils alone, and this is only a part of the daily consumption in the factories in Grasse. The diligent stirring of the flowers in the fat-bath is carried on by female workers, the expression by means of hydraulic presses is done by men. After the clearing of the fat by deposition and straining, the finished pommade is at once weighed off in tin boxes or passes into the large subterranean storerooms, in which it will remain very good until at least the next season.

Notwithstanding the exemplary pains which are spent upon this "infusion à chaud," the fat still remains fat, gradually but inevitably undergoing change and becoming rancid. The question suggests itself whether the fat might not be replaced by the unalterable paraffin which has so successfully competed with fat in pharmacy. It might be thought that such a preparation as the unguentum paraffini of the German Pharmacopœia would be particularly suited to acquire the most delicate perfume and preserve it faithfully. But Professor Flückiger was assured by M. Roure that this is by no means the case.

Why this should be, appears inexplicable, but the inapplicability of paraffin is so decided that even the addition of it to fat in the preparation of pommades by the foregoing method is said to have proved injurious. Professor Flückiger considers this point worthy of further investigation, and remarks that results obtained by himself, some experiments upon a small scale were hardly confirmatory of the statements.

In the incorporation of the most delicate perfumes with fat the above method of that of "*infusion à chaud*" is replaced by "*enfleurage*." For this purpose, light square wooden frames, about 18 inches each way, in which a plate of glass can be placed, are used. All the frames and glass plates are of the same size; when piled up one upon another, therefore, they form small, tolerably well-closed compartments. Upon each glass is spread a weighed quantity of fat in a thin layer, and this is strewn thickly with flowers. Sometimes, however, the one side of the glass plate is covered with flowers only, and the layer of fat is confined to the other glass wall of each compartment, so that contact of the flowers with the fat is avoided. When a perfumed oil is desired, use may be made of cloths saturated with oil for the *enfleurage*. The fat is kept shut up in these glass compartments for a longer or shorter time according to the nature of the flowers and the qualities of the article required and the flowers have to be repeatedly removed, even as often as every day. Many kinds of pommades require some weeks of *enfleurage*.

A portion of the pommades obtained by these methods is eventually used in the preparation of the odorous "*extraits*." This is the name by which the extracts obtained by treatment of these preparations (and other odorous substances) with strong alcohol are known in French perfumery. For this purpose the pommades are placed in copper drums, where by means of powerful stirrers a most intimate mixing of the alcohol with the fat is continued for hours. The alcohol takes up scarcely any of the fat, but the greater part of the odorous substances. By this method the odorous constituents, whether essential oils or other compounds is not known, which cannot be satisfactorily obtained by distillation, are transferred in a pure and unaltered form to the alcohol. The fat takes up little else from the respective flowers, and probably retains a small quantity of matter unconnected with the perfume which it gives up very pure to the alcohol. After this has been removed, the fat is placed in a still and the alcohol recovered for further use; the

fat, on the contrary, is not again employed in any part of the manufacture. It would appear that decomposition commences during the long kneading with alcohol in contact with air, although the drums in which the "extraits" are made are kept closed. But there can be no doubt the fat could be rendered serviceable again; at present it passes from the perfume manufacturer to the soap boiler.

Similar "extraits" may be prepared from plants, when no coloring matter interferes, by simple digestion with alcohol.—*Pharm. Jour. and Trans.* Dec. 13, 1884, p. 468.

CRYSTALLIZED ARBUTIN AND ARBUTOSE.¹

BY J. DALMON

The remarkable memoir published by Lewin² upon the transformation of arbutin, the active principle of the bearberry (*Arctostaphylos Uva-Ursi*), into hydroquinon in the animal economy has directed attention to this compound, which is thought to be destined to take an important position in the materia medica among the antiseptic agents. The author has therefore been induced to take up the chemical study of arbutin, with a view to obtaining it in a pure crystalline condition and of devising a rapid and economical process for its preparation.

Arbutin, in a state of absolute purity, occurs in handsome white shining crystals, most frequently arranged in rays round a central mamelon. It has a bitter taste which develops upon the palate and presents some analogy with that of quassin.

Arbutin is a glucoside. Kawalier, who appears to have been the first to isolate it, attributed to it the formula $C_{32}H_{44}O_{19}$. Strecker afterwards represented it by $C_{12}H_{16}O_7$. Subsequent analyses by Hlasiwetz and Habermann led, however, to the formula $C_{25}H_{34}O_{14}$. It is very soluble in water, slightly soluble in cold alcohol, and scarcely soluble in ether. Under the influence of weak acids arbutin is decomposed into glucose and hydroquinon; at the same time, there is produced, according to the author, a considerable proportion of the methylic ether of hydroquinon. Further investigation, however, is required to clear up the exact nature of the decomposition. According to Lewin, an aqueous solution of arbutin does not reduce an alkaline cupric solu-

¹ "Bulletin Commercial," (L'Union Pharmaceutique,) xii, 440.

² "Pharmaceutical Journal," [3], xiv, 490.

tion, this reaction only occurring when some decomposition has taken place; neither does yeast set up fermentation with pure arbutin.

Arbutin is colored blue by dilute solution of perchloride of iron. In testing for this glucoside, the substance to be examined is moistened with strong nitric acid, then boiled with a mixture of eight volumes of alcohol to one of sulphuric acid; finally, water and an excess of potash are added, when the liquid takes the violet tint of the potash salt and of dinitroquinon.

The preparation of arbutin, although very simple in theory, presents considerable difficulty in practice. The bearberry is especially rich in tannin (averaging 35 per cent.), and in addition contains gallic acid, urson, a resinous matter, gum, chlorophyll, pectin, besides arbutin, to which last it appears to owe the greater part of its therapeutic properties. All these principles, with the exception of urson, are soluble in boiling water.

The process given by the author for the preparation of arbutin is to treat by successive decoctions the drug reduced to a coarse powder, then to combine the products and precipitate the tannin and extractive matters with subacetate of lead. The decolorized liquid is treated with sulphydric acid and evaporated rapidly. The arbutin crystallizes upon cooling in the concentrated liquor; but in consequence of the decomposition of a certain quantity of arbutin during the operation a sticky crystalline mass is obtained which dries only imperfectly. This complex product is called "arbutose" by the author, who says it is tolerably uniform in composition, the proportions being about 55 per cent. of crystalline arbutin, 35 per cent. of glucose and 10 per cent. of water. In order to obtain the crystalline arbutin this arbutose is dried in the air as far as possible, treated with charcoal and then with successive quantities of alcohol and distilled water.

But the author is of opinion that, with the exception of solutions intended for hypodermic injection, for which only the crystallized arbutin should be used, arbutose may be used in all pharmaceutical preparations. In order to determine its strength it is only necessary to estimate the glucose by means of cupropotassic solution, and deduct this and the water, the remainder representing pure arbutin. Arbutin may also be administered under the form of an elixir or in pills.

Arbutin is non-poisonous, and may be given in doses of from 50 centigrams to 2 grams twice daily. Under the influence of this glucoside the urine will after the second day frequently show a green color,

which is due to the presence of hydroquinon. The author has observed that on his own person large doses have a tendency to produce an eruption of the skin, a fact of which it would be necessary to take cognizance when administering arbutin to patients of herpetic temperament.—*Phar. Jour. and Trans.*, Feb. 14, 1885, p. 659.

NOTE ON THE PURITY OF COMMERCIAL KAMALA.

BY P. W. SQUIRE, F.C.S., AND R. A. CRIPPS.

Having had occasion, a short time ago, to examine a sample of kamala before buying, we were somewhat surprised to find a very large proportion of ash, which led us to obtain a number of samples from good houses, with a view of determining to what extent this article is contaminated with earthy impurities. The results were so surprising that we have thought them sufficiently important to embody in this short note.

In the "Pharmaceutical Journal," [3], vol. i, p. 708, it is stated that "kamala always contains from 6 to 10 per cent. of sand, and 1 to 2 per cent. of sesquioxide of iron," while in a paper by Mr. T. B. Groves, read before the British Pharmaceutical Conference in 1872, the amount of ash is said to be less than 4 per cent. Flückiger and Hanbury give only 1·37 per cent., and the United States Pharmacopœia recognizes an article containing not more than 8 per cent.

As will be seen by the following table, our results vary from 6·02 to 61·5 per cent.; only one sample can fairly be supposed to be genuine. The ash in most cases consisted of a reddish sand, but its composition was not determined, while the best sample left a greyish ash, about one-half of which was insoluble in hydrochloric acid.

Sample.	Amount of ash.	Color of ash.
A	25 per cent.	Reddish.
B	13·5 "	Greyish.
C	61·5 "	Reddish.
D	24·0 "	"
E	59·6 "	"
F	40·3 "	"
G	46·2 "	"
H	47·3 "	"
I	30·3 "	"
J	6·02 "	Greyish.
K	26·7 "	Reddish.
L	47·6 "	"

—*Phar. Jour. and Trans.*, Feb. 14, 1885, p. 654.

THE DETECTION OF ALOES IN PHARMACEUTICAL PREPARATIONS.¹

BY R. A. CRIPPS AND T. S. DYMOND.

Among the difficult problems occasionally met with by a chemist is that of detecting aloes in compound mixtures. This involves, by all ordinary methods, a considerable amount of trouble in separating the various substances by means of solvents, and entails the use of a large quantity of substance, which in the case of pills, etc., cannot always be spared; the results, even then, are often unsatisfactory. Perhaps the test proposed by Bornträger (*Zeitschrift für anal. Chem.*, xix, 165), is the best of those hitherto published. It consists in extracting the substance with alcohol, filtering, shaking the filtrate with benzol, removing the benzol layer and agitating it with ammonia; on standing the aqueous liquid should assume a pink color in presence of aloes. This test was applied to a number of different kinds of aloes, for most of which our thanks are due to Mr. Holmes, but the results were not very satisfactory, some of the specimens requiring twenty-four hours to develop the pink color, only four giving it at all distinctly at once. Mr. R. H. Groves has pointed out (*Pharm. Journ.* [3], xi, 1045) that certain precautions are necessary to render the test trustworthy, and that the color reaction is not due to the aloin, and it has also been shown by Lenz (*Zeitschrift für anal. Chem.*, xxi, 220) that any substance containing chrysophanic acid also gives this coloration, and it is, therefore, useless for distinguishing aloes from rhubarb, etc.

The following test has been proposed by Klunge (*Archiv der Pharm.*, 1883, 363). To an aqueous solution of the suspected substance, diluted with water till nearly colorless, a drop of copper sulphate solution is added. An intense yellow coloration, which on warming with a little chloride of sodium changes to a deep red or violet, indicates the presence of aloes. This test is also unsatisfactory, for neither do all the varieties of aloes give this deep red color, nor is the yellow color, though distinctive of aloes, seen in solutions containing already a yellow coloring matter such as saffron.

In view of this unsatisfactory state of the detection of aloes, we now propose a test depending, first, on the reaction given by aloes with sulphuric acid and nitric acid; secondly, on the reaction of the resulting acid mixture with water; and thirdly, on the reaction of this diluted

¹ Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, February 4, 1885.

acid mixture with ammonia. The application of these reactions in the manner we prescribe constitutes, we think, a new and useful test for aloes. This test can be applied directly to the substance suspected, if a solid; but liquids should first be evaporated so as to leave a thin film of extract on the sides of the dish, to which the test is then applied.

The following is the method adopted: Place 1 grain of the substance in a glass mortar standing on white paper; add now 16 drops of strong sulphuric acid and triturate till the whole is dissolved; then add 4 drops of nitric acid, sp. gr. 1.42, and lastly, 1 ounce of distilled water. If aloes be present a color varying from deep orange to crimson will be produced, according to the kind of aloes employed. To confirm, add ammonia, when the color is deepened, usually to a deep claret. This test was first applied to the same series of specimens as Bornträger's and Klunge's tests were applied to, and, without exception, was found to give good results; in fact, not only was the presence of aloes detected, but a fair indication of the kind of aloes was given, the varieties of Barbadoes, true Socotrine and Natal producing a crimson, while hepatic and Cape only a deep orange-red. We also used for comparison the test with sulphuric acid and vapor of nitric acid, which produces with certain aloes a play of colors passing through green, blue and violet to crimson; our results are shown in the following table:

Variety of Aloes.	Bornträger's Test.	Klunge's Test.	H ₂ SO ₄ and vapor of HNO ₃ .	Cripps and Dymond's Test.	Cripps and Dymond's Test with Ammonia.
Barbadoes.....	Pale rose color.	Deep red.	Faint blue color.	Crimson.	Deep claret.
Natal	Very faint pink.	Faint red.	Deep blue color.	Deep crimson.	Intense brownish-red.
Curacao.....	Fine rose color.	Deep red.	Faint blue color.	Crimson.	Intense claret.
Hepatic.....	Faint color after 24 hours.	Nil.	Nil.	Orange-red.	Claret.
Hepatic (Indian).	Faint color after 24 hours.	Nil.	Nil.	Orange-red.	Pale claret.
Cape.....	Faint color after 24 hours.	Nil.	Nil.	Orange-red.	Pale claret.
Socotrine (true)...	Pale rose color.	Faint red.	Very faint blue color.	Pale crimson.	Deep claret.
Socotrine (commercial), three samples.....	Pale rose color after 24 hours.	Nil.	Nil.	Orange-red.	Claret.
Socotrine (Mocha or Zanzibar)....	Pale rose color.	Red.	Faint blue color.	Crimson.	Deep claret.
Aloes juice (Natal).....	Pale brownish pink.	.....	.....	Crimson.	Intense brownish-red.

Having thus proved that the test is applicable to any variety of aloes, it remained to be determined whether the presence of aloes in complex mixtures could be proved, and also whether any other substance will give the same reaction. With this object we have carefully examined a very large number of preparations, first those which were known to contain aloes, then other extracts, etc.

The following table shows the results :

Name of preparation.	Cripps and Dymond's test.	Cripps and Dymond's test with AmHO.
Barbaloin.	Purplish-red.	Red.
Jafferabad aloin.	Purplish-red.	Red.
Ext. aloes, barb.	Crimson.	Red.
Ext. aloes, socot.	Crimson.	Red.
Dec. aloes comp.	Orange-red.	Red.
Vin. aloes.	Orange-red.	Red.
Tinct. aloes.	Orange-red.	Red.
Pil. aloes, barb.	Crimson.	Red.
Pil. aloes, socot. (1).	Pale crimson.	Red.
Pil. aloes, socot. (2).	Orange-red.	Red.
Pil. aloes et assaf. (1).	Pale crimson.	Red.
Pil. aloes et assaf. (2).	Orange-red.	Red.
Pil. aloes et ferri.	Crimson.	Red.
Pil. aloes et myrrh.	Orange.	Red.
Pil. coloc. comp.	Crimson.	Red.
Pil. coloc. c. hyos.	Orange-red.	Red.
Pil. cambog. comp.	Orange-red.	Red.
Pil. rhei comp.	Crimson.	Red.
Pil. ipecac. c. scilla.	Pale yellow.	Yellow.
Pil. saponis comp.	Yellow.	Yellow.
Pulv. sennæ.	Orange-red.	Red.
Ext. aconiti.	Yellow.	Yellow.
Ext. bellad.	Yellow.	Yellow.
Ext. colchici.	Pale yellow.	Pale orange.
Ext. coloc. simp.	Pale yellow.	Yellow.
Ext. coloc. comp.	Orange-red.	Red.
Ext. conii.	Brownish-yellow.	Yellow.
Ext. frangulæ.	Orange-red.	Red.
Ext. gentianæ.	Pale yellow.	Yellow.
Ext. jalapæ.	Pale yellow.	Yellow.
Ext. lupuli.	Orange-yellow.	Yellow.
Ext. nucis vom.	Orange.	Yellow.
Ext. opii.	Orange.	Orange.
Ext. quassia.	Deep yellow.	Yellow.
Ext. rhei.	Orange-red.	Red.
Ext. taraxaci.	Pale yellow.	Yellow.
Fel bovin. purif.	Yellow.	Yellow.
Rad. rhei.	Orange-red.	Red.
Salicin.	Pale yellow.	Nearly colorless.
Croci stig.	Yellowish.	Yellow.
Acid. chrysophanic.	Deep orange.	Red.
Resin. scammon.	Pale yellow.	Yellow.

From the above table it will be seen that though the presence of aloes never fails to make itself manifest, rhubarb and substances containing chrysophanic acid behave in a similar way ; but a nearly col-

orless aqueous solution of aloes does not become pink when ammonia is added, as is the case with solutions of substances containing chrysophanic acid, and in this way aloes may be distinguished. To this rule senna is the only exception.

The probable explanation of the color reaction we have described is that chrysammic acid is produced by the oxidation of the aloin, a reaction which Tilden has shown takes place when aloes is treated for some time with nitric acid alone ("Year-Book of Pharmacy," 1870, 1872, 1875, 1877). The red solution of chrysammic acid is changed by the action of ammonia to deep claret chrysamide. This reaction does not explain the color produced with Natal aloes, which, according to Tilden, yields no chrysammic acid.—*Phar. Jour. and Trans.*, Feb. 7, 1885, p. 633.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Chemistry of Daphnetin.—H. Stümkel has shown, in 1879, that this compound is most likely a dioxy coumarin. W. Will and O. Jung have now further investigated this decomposition product of daphnin. About 20 kilos of extract of mezereon are necessary for preparing about 30 grams of daphnetin, from which a number of derivatives were prepared, showing that daphnetin has the same relation to pyrogalllic acid as coumarin has to phenol, umbelliferon to resorcin, and most likely aesculetin to phloroglucin.—*Berichte D. Chem. Ges.*, 1884, p. 1081–1091.

Buxus sempervirens, Lin.—G. A. Barbaglia has separated from the leaves and twigs of the box a fourth alkaloid, which he names *parabuxinidine*. It crystallizes in thin colorless prisms, is insoluble in water, soluble in ether, freely soluble in alcohol, colors turmeric paper deep red, and gives with an alcoholic solution of oxalic acid a heavy white precipitate consisting of minute colorless rhombic plates.—*Ber. d. Chem. Ges.*, 1884, 2655.

Chaulmoogra Seed.—Dr. Jos. Moeller has examined the seeds of three species of Bixaceæ, with the following results:

1. *Gynocardia odorata*, R. Brown. The seeds are about 3 Cm. long and 1.5 Cm. in their greatest breadth, elongated ovate, somewhat flattened and irregularly angular; the hilum is at the pointed end. The surface is dull yellowish gray, and somewhat scurfy to the touch from an adhering thin layer of pulp. The seeds weigh about 3 Gm., of

which the integument is 0·8 Gm. The latter consists of an outer and inner layer of stone cells placed parallel to the surface, and between these two layers of two or three rows of stone cells, the long axes of which are nearly at right angles with the former cells. The inner surface of the sclerenchymatous tissue is covered with a delicate and partially broken layer of elongated parenchyma cells. The endosperm consists of tolerably thick-walled cells filled with solid colorless fat and large yellow spherical or irregularly rounded bodies, insoluble in alcohol and benzol; starch and tannin are absent; calcium oxalate crystals were not observed.

2. *Hydnocarpus anthelmintica*, *Pierre*. (See "Amer. Jour. Phar.," 1884, p. 526.) The seeds are about 18·14 Mm. broad, little longer, resemble a small bulb in shape, weigh barely 2 Gm. (the albumen 0·6 Gm.), are brownish black, rough, hard, and have a large rayed hilum. The integument is 1·5 Mm., thick, and has a lighter colored inner layer, 0·15 Mm. thick, and consisting of tangentially arranged, and relatively little thickened, stone cells; the cells of the middle layer are placed at right angles to the surface; those of the exterior layer are tangentially arranged, and those of the adhering pulp are rather small and frequently interspersed with groups of stone cells. The cells of the endosperm are smaller than in *Gynocardia*, and do not contain the yellow bodies seen in the latter, but besides oil contain numerous colorless roundish albuminoid granules.

3. *Hydnocarpus inebrians*, *Vahl*. Some of the seeds resemble the preceding, but are flatter, whilst others are pointedly elliptical in shape. They attain a length of 3 Cm., a breadth of 15 Mm. and a thickness of 10 or 12 Mm. The hilum is prominent and warty, the surface longitudinally wrinkled. The weight of the smaller seeds is about 1 Gm. (the integument one-third), of the larger seeds, about 2 Gm. The integument is 0·2 Mm. thick, and consists of three layers of stone cells, arranged as in the two preceding seeds, but the middle layer has only one, or at most two, rows of cells. The adhering pulp resembles that of *H. anthelmintica*. The endosperm is covered with a layer of thin-walled brownish red cells, but is itself colorless, and teems with fat and protein globules.—*Phar. Jour. and Trans.*, October 25, 1884, p. 321.

Euphorbia pilulifera, *Linné*.—This plant, which has long been in use in tropical countries for various complaints, and has lately been introduced here as a remedy in asthma, was analyzed by Charles G. Levison, Ph. G., San Francisco, Cal., with the following results:

	Per cent.
Moisture.....	25.00
Amount soluble in ether, 725.....	15.00
" " alcohol, 820.....	5.75
" " water.....	16.60
Insoluble residue, consisting of cellulose, lignin and siliceous earth, etc.....	62.65
	<hr/> 100.00
Ash.....	20.00
Amount soluble in water, including potassium, sodium and magnesium, phosphates, sulphates, chlorides and carbonates.....	7.50
Amount soluble in diluted HCl, including calcium phosphates.....	3.50
Insoluble residue, consisting principally of silica and sand...	9.00
	<hr/> 20.00
Amount extracted by ether, 725.....	15.00
Resin soluble in chloroform, CS ₂ , glacial acetic acid: glucoside.....	2.50
Wax, non-volatile, soluble in CS ₂ , chloroform, benzin and boiling 90 per cent. alcohol, and insoluble in cold alcohol..	6.00
Chlorophyll.....	.25
Insoluble residue.....	.75
Ash of extractive.....	.50
Volatile matter driven off by heat.....	5.00
Tannin.....	Traces
	<hr/> 15.00
Amount extracted by alcohol.....	5.75
Resin, glucoside, soluble in 90 per cent. alcohol, and insoluble in chloroform, ether and petroleum benzin.....	3.00
Resin, glucoside, soluble in 75 per cent. alcohol; insolubilities, ditto, as above.....	2.00
Resin, glucoside, soluble in 50 per cent. alcohol; insolubilities, ditto.....	.50
Ash of extractive.....	.25
	<hr/> 5.75
Amount extracted by water.....	16.60
Starch colored blue by iodine and reducing Fehling's solution...	5.30
Albumen soluble in acetic and phosphoric acids, and insoluble in nitric acid and alcohol, and coagulated by heat of 154°F.....	2.50
Pectin coagulated by alcohol.....	1.30
Gum insoluble in alcohol and soluble in water.....	1.70
Protein substance similar to albumen and not coagulated by heat.....	5.80
	<hr/> 16.60
— <i>Therap. Gazette</i> , Dec. 1884, p. 551.	

Betaine in Cotton Seed.—In the mother-liquor, from which melitose had been separated, H. Ritthaussen and F. Weger found betaine, but have not yet ascertained in what form the alkaloid occurs in cotton seed.—*Jour. f. prak. Chem.*, xxx, pp. 32–37.

Betaine was discovered by Scheibler (1866) in the juice of the sugar beet, and was shown by Husemann (1875) to be identical with *lycine*, an alkaloid isolated from *Lycium vulgare*, *Dunal*, by Husemann and Marmé (1863). The same alkaloid is also obtained by the careful oxidation of *neurine*, an alkaloid obtainable from bile, brain and yolk of egg.

NOTE ON AN IMPURITY IN ETHER.

BY C. J. H. WARDEN, M.D.,

Chemical Examiner to the Government of Bengal.

While in India last year, I accidentally discovered that all the samples of ether in my laboratory, when agitated with an aqueous solution of potassic iodide, liberated iodine, and communicated a yellow, or dark reddish color to the solution, the ether remaining colorless.

On agitating the ether first with a strong aqueous solution of potassic hydrate, or solid caustic potash, the caustic potash solution was colored yellow and the solid hydrate incrustated with a dark reddish-yellow deposit, and the ether thus purified no longer possessed the power of liberating iodine from iodide of potassium.

The samples of ether tested had all been received from well-known English druggists, and the bottles were labelled "ether pur. B.P." Since I have been in Europe I have only had an opportunity of examining one specimen and this also liberated iodine. On examination, however, it will probably be ascertained that most of the ether in the market responds to the test. I have not been able to investigate the cause of the reaction; it is very possibly due to the presence of aldehyde in the ether, and this view receives support from the action of the ether on caustic potash, already described, the yellow coloration being caused by the formation of aldehyde resin.

As ether is now extensively employed as an anæsthetic, and as aldehyde (assuming its presence) is not inert, its presence, or that of any other impurity, in the drug intended for inhalation must be considered objectionable. Aldehyde is described¹ as possessing a peculiar ethereal,

¹ Roscoe's "Organic Chemistry."

suffocating odor, and its vapor when inhaled in large quantity produces a cramp, which for a few seconds takes away the power of respiration (Liebig). The question suggests itself, may not the peculiar suffocating sensation often experienced during ether inhalation be caused by the presence of this compound?

The test I have described may be applied in two ways; two or three drachms of the ether are poured into a test tube, and about a drachm of a freshly prepared solution of iodide of potassium in water added, the tube corked, and the contents well agitated. If the ether be pure, on looking down the tube, while standing on a white surface, no yellow coloration of the aqueous stratum will be apparent. The other plan of applying the test is to add a few drops of starch mucilage to the ether and iodide of potassium solution and then to agitate; if iodine be liberated, it is recognized by the blueing of the starch.—*Phar. Jour. and Trans.*, Jan. 3, 1885, p. 521.

APPARATUS FOR CONTINUOUS PERCOLATION WITH BOILING FLUIDS.

BY W. WATSON WILL.

In the issue of the "Pharmaceutical Journal" of October 11th, there is a description of an apparatus for continuous percolation, by Dr. Thresh, which is evidently an improvement upon the apparatus originally used by Tollens for the same purpose, the difference between the two apparatus consisting in the arrangement of the percolating tube; otherwise in principle they are the same.

In examining Dr. Thresh's apparatus I came to the conclusion that unless such an apparatus were employed in the hands of a skillful operator there is a considerable liability that the fine tube, with curved apex, would be broken in packing the substance for exhaustion; also that to make a punted and perforated tube such as he describes requires a considerable amount of skill. Otherwise it has the advantage over Tollen's apparatus, that through the centre of the substance there would pass a constant current of the vapor of the solvent by means of the fine tube, by which means the substance under examination is quickly heated throughout the mass.

I have used for some considerable time an apparatus much similar, but simpler in its construction, for the estimation of cinchona barks, scammony, etc. It consists of the following parts:

1. An ordinary flask, with a long narrow neck, and fitted with a perforated sound cork, or india-rubber stopper.

2. A half-ounce glass syringe, having its lower end stopped by a small plug of cotton wool; the upper end is closed by a perforated cork, through which passes the pointed end of the condensing tube, thus fixing the two tubes firmly together.

3. A long glass tube pointed at one end and having a small hole made near the pointed end to admit of the inflow of the vapor to be condensed.

4. Another, but wider glass tube, drawn out at one end, so as to admit of a perforated cork, through which passes the upper limb of the condensing tube. Near the lower end of this tube a small hole is made, into which is fixed a narrow glass tube, to which is attached a piece of india-rubber tubing, and if necessary closed by a clamp.

The working of the apparatus is very simple. Having placed the substance to be exhausted in the tube 2, the condensing tube is now firmly fixed into position and the liquid used for exhausting is poured down the tube. A current of cold water is now allowed to flow into tube 4, this being regulated by means of the clamp. Heat is now applied to the flask, when the vapor passes up and enters tube 3, where it condenses in the upper limb and flows back into the percolator.—*Phar. Jour. and Trans.*, Nov. 8, 1884, p. 363.

At the evening meeting, held November 5, Mr. Waite showed an extractor for continuous percolation, on the same principle as Dr. Thresh's, but more simple in construction. The apparatus consisted essentially of a single tube, of suitable calibre, drawn out at one end to a point, and fitted into the neck of a wide-bottomed flask, so that the point reached within a short distance of the bottom of the flask. At the side of this tube was a hole through which the vapor from the boiling liquid in the flask rose to a condenser, so that the condensed solvent fell upon the substance to be exhausted placed in the lower part of the tube and after percolating through it fell into the flask, where it was again vaporized and passed back as a vapor through the aperture above the mark. Mr. Waite said he had found the apparatus answer very satisfactorily.

ANÆSTHESIA BY CHLORAL.—M. Bouchut gives chloral in doses of from two to three grams, according to the age of the patient, and in a single dose, and asserts that it is a perfect anæsthetic, without any disagreeable result; and that he has administered it in this way in a large number of cases.—*New Eng. Med. Monthly*.

PRACTICAL NOTES.

BY THE EDITOR.

Linimentum Ammoniac.—Mr. F. H. Alcock states that sesame oil makes a more satisfactory preparation than olive oil, or a number of other oils experimented with; even after standing three months there is no sign of separation, and the liniment presents a beautiful creamy consistence and color, but slightly altered during the time stated.—*Phar. Jour. and Trans.*, Oct. 11, 1884, p. 282.

Uses of Paraffin Oil.—Leon Crismer gives an interesting account of the uses to which paraffin oil may be put as a solvent and reagent.

Test for Water in Ether, etc.—Liquid paraffin dissolves in all proportions in anhydrous chloroform or ether, yielding clear solutions; but in the presence of water or of diluted alcohol the solutions are turbid. Liquid paraffin dissolves sparingly in absolute alcohol; such a solution at once becomes turbid on the addition of weaker alcohol. Methyl alcohol has a very similar behavior with paraffin oil. The presence of water in the liquids named may thus be readily ascertained.

Solvent Properties.—Liquid paraffin is a good solvent for amyl alcohol, crude fusel oil, chlorine, bromine, iodine and the phosphorus and alkyl compounds of the halogens. White phosphorus kept under paraffin oil unites readily and without danger of explosion with bromine dropped into the liquid, the mixture being kept cool; the phosphorus tri-bromide dissolved in the liquid paraffin, is decomposed on dropping in water, *hydrobromic acid* being given off, and may be completely dehydrated by passing the gas over phosphoric anhydride.

Hydriodic acid may be prepared in a similar manner. The iodine is added in small quantities to the phosphorus kept under liquid paraffin; water is added, and the mixture is finally heated in a sand bath.

Ethyl iodide is expeditiously prepared using liquid paraffin as a solvent for the phosphorus triiodide, adding the alcohol gradually, returning the ether by means of a reversed cooler to the mixture and finally distilling. 13 Gm. phosphorus, 160 iodine and 60 absolute alcohol yielded 190 grams colorless ethyl iodide, which after treatment with a little iodine, sodium and finally with calcium chloride, furnished 182 Gm. ethyl iodide, sp. gr. 1.944 at 15°C., and boiling at 72.5°C.

Methyl iodide was prepared in the same way; the yield was 90 per cent.—*Berichte D. Chem. Ges.*, 1884, 649–652.

Excretion of Kairine.—Petri and Lehmann ascertained that kairine or hydrochlorate of oxyquinolinethyl hydride is found in the urine as an ethersulpho acid which is not destroyed during the ammoniacal fermentation of the urine, but is slowly decomposed by long-continued boiling with hydrochloric acid. Its solution slightly acidulated with acetic acid acquires with a solution of chlorinated lime a beautiful fuchsin red color, which begins to fade after about 30 minutes.—*Centralbl. Med. Wiss.*, 1884, p. 305.

Specific Gravity of Sulphuric Acid.—D. Mendelejew shows that the specific gravity of sulphuric acid (monohydrate) at 15°C. compared with water of 4°C. and calculated for the vacuum, is 1.8371, or very near this figure; his own determinations agree with those of Marignac, F. Kohlrausch and others, while Lunge's result, 1.8384, is too high.—*Ber. d. Ch. Ges.*, 1884, pp. 2536–2541.

Gallisin (see "Am. Jour. Phar.," 1885, p. 42) has been found by C. Schmitt and Jos. Rosenhek in commercial starch-sugars varying in quantity between 6.82 and 22.49 per cent., the water present amounting to from 14.11 to 21.59 per cent. By contact with pancreas gallisin is converted into a fermentable sugar yielding ethyl-alcohol; but the complete conversion has not yet been attained. The action of chlorosulphonic acid, of bromine, and of dry distillation with lime, has also been studied; the latter process yielded acetic acid, acetone and metacetone.—*Ber. d. Chem. Ges.*, 1884, pp. 2456–2467.

ACTION OF THE DIFFERENT ALKALOIDS OF ACONITE ON THE HEART.—Dr. A. Torsellini has recently made a series of experiments on the heart of the frog and the toad with the following results:

1. Nitrate of aconitine caused, in the exsected heart a slight, in the removed heart strong diminution of the cardiac beat; and in the latter also a very slight and transitory lessening of the systolic elevation. In neither was the rhythm irregular.

2. Nitrate of napelline causes irregularity of the rhythm in each, lessens the systolic elevation, and causes no slowing of the heart-beats in the exsected heart, but an increased contraction of the unremoved heart.

3. Nitrate of lycoctonine slightly increases the beats of the exsected heart, increases the systolic elevation in both, and does not change the regularity of the heart's action in the least; on the contrary, it antagonizes the irregularity caused by napelline.

4. Aconitic acid acts on the heart in a decidedly paralyzing manner.

From these results it is seen that the different alkaloids of aconite not only act differently, but that some antagonize others, as regards the effects on the heart.—*Centralbl. für die gesammte Therap.*, October, 1884; *Medical News*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, February 17, 1885.

The meeting was called to order by the registrar, and upon motion of Mr. A. Blair, Mr. Robbins was called to the chair.

The minutes of the last Pharmaceutical meeting were read and no corrections being called for they were approved.

Prof. Maisch presented from the British Pharmaceutical Conference a copy of the Year Book of Pharmacy for 1884.

Mr. Jos. W. England, Ph. G., of the class 1883, read a paper upon *tincture of ferric chloride* in which he reviewed the formulæ of the Pharmacopœia from 1840 to the present one, as well as of some recent propositions made in the pharmaceutical journals.

Prof. Maisch wished to know how long it would require to prepare, say a quart of the solution, by the formula proposed. In reply Mr. England stated, with inferior opportunities it required about an hour, and that under more favorable circumstances he thought it possible to shorten the process considerably. The paper was accompanied by samples of the various grades of solution and tincture.

Mr. Gustavus Pile stated that in order to overcome any trouble that might arise from accidental spilling or from the use of acid of insufficient strength, he had prepared a specific gravity table showing the amount of ferrous chloride in the solution and giving the requisite weight of hydrochloric acid to be added in the subsequent operation. In this way a carboy of acid may be worked up at a time, adding the iron till saturation is effected, making no account of the actual weights of the materials used. After the action has ceased, the liquid is filtered and the specific gravity taken; by comparing this with the table, the weight of acid to be added to each pint is at once ascertained, and the operation proceeded with in the usual manner.

On motion the paper was referred to the publication committee (see page 113.)

Prof. Trimble read a paper upon an *alkaloid in the fruit of Burdock*. The experiments were made in the laboratory of the College by himself and Mr. Macfarland, of the present junior class. On motion the paper was referred to the committee on publication (see page 127.).

Mr. E. T. Ellis exhibited and presented to the cabinet a sample of *Coxe's Hive Syrup*, made over fifty years ago by Dr. Coxe's family, and sold at his residence north-east corner of Broad and Pine streets, in this city. The syrup was subsequently admitted into the Pharmacopœia, and is still recognized as *syrupus scillæ compositus*.

Prof. Maisch exhibited a specimen of *Sumatra Benzoin*, of handsome appearance, and yet the sample proved to contain 33 per cent. of bark and woody matter, which was left behind on preparing the tincture of benzoin; he said that in many cases it was impossible to form any opinion of the quality of resins and gum resins by mere appearance.

Prof. Trimble stated that one of the students had examined *scammony resin* in connection with matter for his thesis, and had found that nearly all the scammony of commerce contained starch, and that the sample in the College cabinet was fully up to the standard required by the Pharmacopœia.

On motion adjourned.

T. S. WIEGAND, Registrar.

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.

The last social meeting of the present term was held in the Museum of the College February 10, C. C. Meyer, Ph.G., occupying the chair.

Rev. R. B. Westbrook, D. D., delivered an interesting lecture on "The origin of some familiar things," including a number of matters of special interest to the apothecary.

John E. Cook, Ph.G., read two papers entitled "How to experiment in Natural Philosophy," and "Chlorophyll," dwelling in the latter upon the conditions under which the green color is produced, and upon various researches into its composition.

SIXTH INTERNATIONAL PHARMACEUTICAL CONGRESS.

*Under the High Protection of His Majesty the King of the Belgians,
And the Honorary Presidency of the Minister of the Interior and of Public
Instruction, and the Honorary Vice-Presidency of the Burgomaster of
the City of Brussels.*

GENERAL RULES OF THE CONGRESS.

Object of the Congress.

Art. 1. The Sixth International Pharmaceutical Congress will be held in Brussels from the 31st of August to the 6th of September, 1885.

Art. 2. The object of the Congress is to follow up the work commenced in 1865 at Brunswick, and continued in 1867 at Paris, in 1869 at Vienna, in 1874 at St. Petersburg, and in 1881 at London.

The Congress will be able to discuss all questions which are connected with the profession of the pharmacist, the progress of the pharmaceutical sciences and their application to hygiene.

It will exclude from its business all that is foreign to these subjects. Governments, academies, universities and schools of pharmacy, chemistry, hygiene, etc., are invited to lend their co-operation in this work and to cause themselves to be represented in the Congress by delegates.

Business of the Congress.

Art. 3. The Congress will group in four sections all the questions which shall be submitted to it by pharmaceutical societies or persons who have connected themselves with the Congress.

- (a). Professional questions.
- (b). Questions of theoretical or practical pharmacy.
- (c). Questions of chemistry in its relations with hygiene and the public health.
- (d). Questions relative to applied, biological and legal chemistry.

Art. 4. Four questions will be submitted by the Committee of Organization for discussion in the full general meetings. These are:

1°. Examination of the scheme of an International Pharmacopœia elaborated by the Commission nominated at the time of the last Congress in London.

2°. Pharmaceutical Education: The attainments that should be preliminary to pharmaceutical studies: the scientific pharmaceutical studies; the professional applications.

3°. Sophistications of alimentary substances: legislation, administrative service, etc.

4°. Potable waters: The characters of potable waters. The best practical processes, in the actual state of science, to be recommended for the verification of these characters.

Art. 5. The Congress will pursue its objects by means of (*a*) discussions in meetings; (*b*) the publication of its transactions; (*c*) conferences or experimental demonstrations which may be organized during the continuance of the Congress.

The Sessions.

Art. 6. The Congress will last during six days. There will be two sittings each day. The morning will be devoted to the meetings of the sections; the afternoons to the general meetings.

Art. 7. Independently of the sittings of the sections and the general meetings there will be two special reunions: one at the opening and the other at the close. In the first the Committee of Organization will proceed to the nomination of the definite committee of the Congress and the committees of the sections; in the second it will give an account of all the business transacted.

Art. 8. The sections will discuss the questions set down on their orders of the day by the Committee of Organization. During the continuance of the Congress, however, other questions may be introduced at the close of the orders of the day of the sections upon the initiative of the members and with the consent of the committees.

Art. 9. In the general meetings the discussions will be devoted to reports prepared beforehand. In the sections they will turn upon the communications presented by the members of the Congress.

These reports or communications may consist in expositions of facts or of points of doctrine. Those who bring them forward will assume the responsibility for them.

Except by authorization of the meeting the same speaker will not be able to speak more than twice upon the same subject, and the length of speeches, readings of communications, memoirs, etc., will not be allowed to exceed fifteen minutes. This rule is not applicable to the reporters.

No memoir already published or communicated to a scientific society will be allowed to be read at a sitting.

Art. 10. Although the sessions will be conducted in the French language, the speakers will have liberty of choice as to language for their speeches or communications. In this case, the members who do not express themselves in French will remit an entire translation or a summary of their speeches

to the secretaries of the sittings, and as far as possible the sense of their words will be translated immediately and summarily by one of the members of the meeting.

Publication of the Transactions.

Art. 11. The Committee of Organization is charged with the publication of the account of the labors of the Congress. It will decide as to the total or partial insertion or non-insertion of memoirs, communications, etc.

Composition of the Congress.

Art. 12. The Congress will be composed of all persons, pharmacists and others, who shall pay a subscription of ten francs and who have sent a notice of their adherence.

Art. 13. All the members will have the right to take part in all the labors and deliberations of the Congress, and they will receive the publications.

Art. 14. The Committee of Organization will constitute the provisional committees of the sections. These will elect their definitive committees.

General Arrangements.

Art. 15. The committee will receive with gratitude all publications and communications, which will be acknowledged. The *compte rendu* will make mention of these remittances and the Committee will be able to communicate them to the Congress.

Art. 16. A special regulation, to be agreed to later on, will determine the supplementary executive measures to be taken to insure the satisfactory progress of the work of the Congress. A special bulletin will publish the orders of the day and the *procès-verbaux* of the session; it will give besides, if there be occasion, notices as to excursions, *fêtes*, and in general, all information useful to members of the Congress.

Agreed to at a sitting of the Committee of Organization of the Sixth International Pharmaceutical Congress, December 20th, 1884.

On behalf of the Committee,

D. VAN BASTELAER, *President.*

E. VAN DE VYVERE, *General Secretary.*

—*Phar. Jour. and Trans.*, Jan. 31, 1885, p. 618.

EDITORIAL DEPARTMENT.

THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.—The following communication from Prof. Prescott explains itself.

EDITOR OF THE AMERICAN JOURNAL OF PHARMACY:

In the article of Mr. William B. Thompson on "Advantage of Preliminary Education," a reference is made, on page 75, to the School of Pharmacy of the University of Michigan, beginning as follows: "There has been a steady growth of business rivalry in the more prominent pharmaceutical institutions of this country; some have wisely withdrawn from all competitive effort, and such a course has been received with approval. The future work and standing of these institutions will give ample evidence of

a wise foresight. The University of Michigan was the first institution in this country, we believe, to take the long bold stride of graduating pharmacists without any requirement of preliminary educational or shop training." As this paragraph may meet the eye of pharmacists not acquainted with the requirements of preliminary training in the School of Pharmacy at Ann Arbor, I desire to state that its entrance standard is that of a good high school education. The examination covers—for those taking the college training *before* experience in the shop—three years' schooling in Latin and German, algebra through quadratic equations, botany and elementary physics, beside arithmetic through involution and evolution, and the correct writing of English. For those taking the college course *after* apprenticeship in the shop—the examination covers one years' schooling in Latin or German, with algebra, arithmetic, and correct English writing. Under the stringency of these examinations, fully two-thirds of the admissions to the school are gained by diplomas of graduation in high schools giving preparation for academic colleges. *This* is "the step in the methods of rivalry" taken at Ann Arbor. It is, in truth, a "long and bold stride" in preliminary examination in pharmacy in the United States.

Regarding the non-requirement of apprenticeship by this school—the cause of action of the American Pharmaceutical Association in 1871, and the chief test of the "Convention of Teaching Colleges of Pharmacy," the position of the University of Michigan, whether it be right or whether it be wrong, is not correctly represented by Mr. Thompson. It is that, in this country, it would be quite as useful *to require the college course* (preliminary examination and all) *before the apprenticeship*, as *to require the apprenticeship before the college course*. The diploma of this school is stated to give evidence of college training only, with no disparagement of the shop training, the variable value of which is to be expressed by the certificates of the shop itself.

Mr. Thompson adds a reference to "educating scientific experts, drug assayers, toxicologists, etc.; presuming such to have been a *bona fide* intention," he asks, "would the country find need of so many men to fill positions only casually made necessary?" This question, asked in skepticism by the writer, is answered in good faith by the "Register of Residences and Occupations of the Alumni," published annually by the school in question. The larger proportion of the graduates, in accord with the controlling design of the school, are engaged in dispensing pharmacy, where, in spite of "the groundling and mercenary spirit" lamented by Mr. Thompson, they find every year greater demand for the duties of "drug assayers, etc." With our requirements for entrance, and our severe and sifting college course, holding every student from six to eight hours a day in college from the last week in September to the last week in June, during both years, the numbers of our graduates are not "so many men" as to be open to the objection of "augmenting the ranks of pharmacy," but by virtue of quality, they are felt as a distinct force in pharmaceutical practice.

ALBERT B. PRESCOTT, *Dean*.

UNIVERSITY OF MICHIGAN, SCHOOL OF PHARMACY,
 Ann Arbor, February 23, 1885.

THE SIXTH INTERNATIONAL PHARMACEUTICAL CONGRESS will be held during the coming summer in the city of Brussels, and a series of rules for its government have been drafted, which we publish on another page. A Committee on organization has been formed consisting of prominent Belgian pharmacists, under the presidency of Mr. Van Bastelaer, the president of the General Pharmaceutical Association of Belgium, and of the Pharmaceutical Union of Charleroi. Professors N. Gille, J. Stas and other well-known scientists are honorary members of this Committee. In a preliminary circular dated December 20, 1884, the Committee state that the Congress is intended to be an arena open to all progressive ideas, and its rostrum accessible to all who wish to make known their discoveries or the result of their observations or labors. Besides the questions published elsewhere, other subjects, generally interesting to pharmacists, may be added if proposed by pharmaceutical societies or by adherents to the Congress. Such questions should be sent at as early a date as possible to the general Secretary, E. Van de Vyvere, 14 Montagne aux Herbes-potagères, Bruxelles, to whom also declarations of adherence (for membership) should be addressed (see General Rules, Art. 12).

At the International Congress held in London in 1881 it had been decided that the next Congress should assemble in Brussels in 1884; but it was deemed advisable to postpone it until the present year, one of the main reasons being, that the universal exhibition to be held at Antwerp would be a great attraction to strangers, and secure a larger attendance at the neighboring city of Brussels, which from Antwerp can be reached by rail in about one hour.

It will be remembered that in London an International Committee was organized charged with compiling an international pharmacopœia with the view of equalizing the strength of all potent drugs and their preparations; this Committee has done some work in submitting propositions, the compilation to be elaborated by the chairman, Mr. A. von Waldheim, Vienna, Austria. To what extent this work has progressed, we have not been informed.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the Third Annual Session of the Alabama Pharmaceutical Association, held in the city of Montgomery, May 13, 1884. 8vo, pp. 31.

The next meeting will be held in Anniston, in the northern part of the State, on the first Tuesday in May. The Local Secretary is Jas. N. Gunnel, Oxford. The other officers are: President, P. C. Caudidus, Mobile. Vice-Presidents—J. B. Collier, Opelika; A. L. Stollenwerck, Birmingham, and E. P. Galt, Selma. Secretary, M. M. Stone, Montgomery.

Proceedings of the Ohio State Pharmaceutical Association, at its Sixth Annual Meeting, held in Cincinnati, May, 1884. 8vo, pp. 181.

A brief account of the transactions at this meeting was published on page

396 of our last volume. The next meeting will be held at Sandusky, on the third Wednesday of May next, M. M. Melville, of Sandusky, being the Assistant Secretary.

The following Reports of State Boards (Commissioners) of Pharmacy for the year 1883-1884 have been received :

Illinois.—Pp. 78. With a list of the Registered Pharmacists and Assistant Pharmacists; also, a list of cases prosecuted during the year ending June 30, 1884.

Maine.—With the draft of a law amending the Pharmacy Act of 1877.

West Virginia.—Ten Registered Pharmacists have been stricken from the register for unlawfully selling spirituous liquors.

L' Université de Bruxelles. Notice historique faite à la demande du Conseil d'Administration. Par L. Vanderkindere, Professeur à la Faculté de Philosophie et Lettres. Bruxelles : P. Weissenbruch, 1884. 8vo, pp. 440. The University of Brussels. Historical Notice.

On November 20, 1834, the Free University of Belgium, since 1842 known as the Free University of Brussels, was inaugurated. The handsome volume before us gives a full account of the work done during the fifty years of the existence of the University, which was founded by the liberality of a number of Belgian citizens. During the time named 394 pharmacists completed their education in this institution.

One Hundred Years of Publishing. 1755-1885. Philadelphia : Lea Bros. & Co.

This neat publication gives a succinct history of the publishing house of Mathew Carey, who in January, 1785, commenced issuing "The Pennsylvania Evening Herald," and in a few years added to this two monthly magazines and various books. His successors, in 1829, divided the business, Edward L. Carey taking the retail business, forming the firm of Carey & Hart, the present successors of which are Henry Carey, Baird & Co. The publishing business was retained by Carey & Lea; their successors, Lea & Blanchard, between 1840 and 1850 gradually withdrew from publishing works of fiction and other books, concentrating their attention on works relating to medicine and allied sciences. It is stated that the house had never lost a partner by death, all its members having successively withdrawn in season to enjoy the fruits of well directed industry. Two of the members of the present firm, which was formed at the beginning of the second century after the foundation of the house, are descendants of its founder, Mathew Carey.

Flora of Southern and Lower California. By Chas. Russell Orcott. San Diego, California : 1885. Pp. 13.

This pamphlet is issued as a check list of the flowering plants, ferns and other cryptogams of San Diego County and the adjacent borders of Lower California. The distribution of the plants and other matters of interest are indicated, enhancing the value of this list.

Journal of Mycology. Edited by W. A. Kellermann, Ph.D., Professor in the Kansas State Agricultural College, Manhattan, Kansas; assisted by J. B. Ellis, Newfield, N. J., and B. M. Everhart, West Chester, Pa. Price \$1 per annum.

This is a new monthly, devoted to fungi and the current literature pertaining to the subject. Judging from the initial number it will be a valuable repository of mycological science in general, and of special importance to the North American students of mycology.

Babyhood. Devoted exclusively to the care of infants and young children, and the general interests of the nursery. Edited by L. M. Yale, M. D. and Marion Harland. New York. Price \$1.50 a year.

A new monthly, well printed and handsomely illustrated. The number before us speaks well for the manner in which the objects are to be carried out.

Annual Summary of Engineering and Industrial Progress, 1884.

A reprint of the report of the Secretary of the Franklin Institute.

International Electrical Exhibition, 1884. Reports of Examiners of Section xviii (underground conduits) and of Section xxi., (fire and burglar alarms and annunciators).

These reports covering respectively fifty-five and sixteen pages are reprints from the Journal of the Franklin Institute.

Official Report of the Trustees and Officers of the State Hospital for the Insane, at Danville, Pa. from October 1, 1882 to September 30, 1884. Svo, pp. 51.

Acetate of Lead in Ocular Therapeutics. By David DeBeck, M. D., assistant to the chair of ophthalmology.

Contributions from the ophthalmic clinic, Medical College of Ohio, Cincinnati.

OBITUARY.

WILLIAM A. GELLATLY died in New York, February 13, at the age of fifty-four years. Born in Edinburgh, he came to this country when four years old, and at the age of thirteen he entered the house of W. H. Schieffelin & Co., as an errand boy, rising through various positions to that of a partner in 1860. His entire career was marked by strict integrity and honorable generosity.

JOHN P. BINNS, a graduate of the Philadelphia College of Pharmacy, Class 1882, died in this city December 2, 1884, in the 24th year of his age.

WILLIAM BRAITHWAITE, M. D., died in Leeds, England, January 31, aged seventy-eight years. Since 1840 he edited the "Retrospect of Medicine," which is published in half-yearly volumes, and which will now be continued under the editorial charge of his son, Dr. James Braithwaite.

THE AMERICAN JOURNAL OF PHARMACY.

APRIL, 1885.

PINCKNEYA PUBENS, MICHAUX.

(GEORGIA BARK.)

Natural order, Rubiaceæ; sub-order, Cinchonæ.

BY EDGAR HERMAN NAUDAIN PH.G.

From an Inaugural Essay.

Michaux discovered this plant in 1791, along the banks of the St. Mary's River, Florida, and described it as follows: It grows in bogs along the banks of streams from Florida to South Carolina, near the coast, sometimes attains a height of twenty feet, though as it throws up many stems from the same root, it retains a shrub-like appearance. It has the general botanical characteristics of the Rubiaceæ, the leaves are large, oval, and acute; downy on the under surface as are the flower-clusters which are borne at the end of the branches. These consist of several five-flowered fascicles of purplish spotted flowers. Calyx short, three-lobed, one of the lobes being expanded into a large ovate rose-colored leaf, which is more showy than the flower itself.

The plant is closely related to the cinchonæ, and is one of the many that have been proposed as a substitute for Peruvian bark. From reports of physicians living in States where it grows, it appears to have decided anti-periodic properties, though slower in its action than cinchona bark. The genus was named in honor of Gen. Charles Pinckney, of South Carolina.

Considerable difficulty was experienced in securing a sample of the bark, but through the kindness of Mr. G. J. Luhn, of Charleston, South Carolina, a small quantity was obtained, together with several leaves and a cluster of fruit. The bark was in quills about two inches in length, from $\frac{1}{16}$ to $\frac{1}{8}$ inch in thickness; externally of an ash gray color, and somewhat warty; internally brownish white, of a distinctly bitter taste, and breaking with a short corky fracture.

A portion of the bark was exhausted by repeated digestion, with

water acidulated with hydrochloric acid; but the acid infusion failed to give any reaction for alkaloids when tested with Mayer's test, picric acid, or phospho-molybdic acid. On concentrating a portion of this solution numerous crystals separated; they were boiled with a solution of sodium carbonate and filtered, the filtrate neutralized gave a precipitate with calcium chloride indicating oxalic acid. The insoluble residue was dissolved in acetic acid and tested with ammonium oxalate with which it gave a precipitate indicating that the crystals were calcium oxalate.

Seventy-five grams of the bark in very fine powder were submitted to the action of petroleum benzin (which had previously been redistilled) until it was thoroughly exhausted. On distilling off the benzin a greenish, wax-like substance remained; this was treated with acidulated water (HCl), to which it yielded nothing, giving no reactions when tested for alkaloids. It was next treated with eighty per cent. alcohol, which extracted a small quantity of a yellow resinous body, soluble in ether. The residue consisted of a waxy substance associated with a small amount of chlorophyll. Fixed and volatile oils were found to be absent.

Alcoholic Extract.—The powdered bark from the benzin operation was kept at a temperature of 100° C. until all traces of benzin had disappeared, was then thoroughly exhausted with eighty per cent. alcohol and the tincture distilled; the concentrated liquid was precipitated by an alcoholic solution of normal lead acetate, and the filtrate freed from lead by hydrogen sulphide concentrated and allowed to stand, nothing separating out; on dilution with water a slight precipitate was formed, which on agitating with ether was dissolved, and on evaporation yielded a dark brown resinous body of a slight taste, and soluble in chloroform and bisulphide of carbon.

The aqueous extract failed to give any reaction for alkaloids when tested with picric acid, phospho-molybdic acid and Mayer's test. The remaining aqueous liquid was precipitated by triplumbic acetate, the filtrate was again freed from lead by hydrogen sulphide and concentrated; on allowing it to stand a light brown, distinctly crystalline substance was deposited, weighing about 0.15 gm., having a very bitter taste similar to that of the bark very much concentrated. It failed to reduce Fehling's solution until boiled with dilute sulphuric acid, and it was entirely dissipated by heat. The substance is a glucoside, I think, and I propose for it the name *Pinckneyin*. The precipi-

tate by the triplumbic acetate was suspended in water and freed from lead; on evaporating, a brownish, somewhat bitter extractive was obtained.

The plumbic acetate precipitate was suspended in eighty per cent. alcohol, freed from lead by hydrogen sulphide, concentrated, treated with water, allowed to stand some time, and the resulting precipitate collected, well washed and dissolved in ether, which left on evaporation a light yellow mass, capable of being powdered; its alcoholic solution was very astringent, and was precipitated, giving a bluish green by ferric chloride. The aqueous solution gave, with ferric chloride, a beautiful emerald green color, changed to a wine red by sodium carbonate, was not precipitated by tartar emetic, not precipitated or colored by ferrous sulphate, reduced solution of argentic nitrate, was precipitated by gelatin, and crystallized from dilute alcohol, resembling caffeotannic acid.

Aqueous Extract.—The bark from the alcohol operation was macerated with water and expressed, the liquid gave a copious precipitate with alcohol, which consisted of gum combined with brown coloring matter. On boiling a portion of the exhausted bark with water, the solution gave a blue coloration after cooling with a solution of iodine. One grm. of the bark (air-dry?) on incineration yielded .09 grm. = 9 per cent. of ash, consisting of potassium, sodium, calcium and magnesium combined as chlorides, carbonates and phosphates.

In the "American Journal Pharmacy," February 1881, p. 981, it is stated that Dr. Farr claimed to have detected cinchonine in pinckneya, but from my analysis I am led to think this incorrect, as I failed to discover the slightest trace of alkaloid. Owing to the limited supply of bark at my disposal I was unable to make as complete an analysis as the subject deserves.

OIL OF GAULTHERIA IN RHEUMATISM.—Dr. H. H. Seelye reports the results obtained from oil of gaultheria given in 118 cases of acute articular rheumatism. It can be administered in capsules, alone or with salicylate of sodium, or in soda-water, but the preferred method was in an emulsion in glycerin and water. From 10 to 20 minims were given every two hours during the day, and at intervals of three hours during the night. All forms of rheumatic pain seemed remarkably influenced, but its effect was most marked in acute inflammatory cases. The tendency to cardiac complications seemed not to be increased. The success was so gratifying that further trial of the remedy was strongly urged.—*N. Y. Med. Jour.*, Nov. 8, 1884; *Med. Times.*

RHODODENDRON MAXIMUM, LINNÉ.

(GREAT LAUREL.)

Natural Order, Ericaceæ; sub-order, Ericinæ; tribe, Rhodoreæ.

BY GUSTAV FRANK KUEHNEL, PH.G.

From an Inaugural Essay.

This plant is indigenous to the United States from Maine to Ohio, but chiefly in the mountainous parts of Pennsylvania, and southward along shaded water courses in damp, deep woods; it is a shrub or tree, 6 to 20 feet high, with handsome flowers, the corolla being bell-shaped, an inch broad, of a pale rose color, or nearly white, greenish in the throat on the upper side, and yellow or reddish spotted. The leaves are from 4 to 10 inches long, evergreen, coriaceous, alternate, elliptical oblong, or lance oblong, acute, narrowed towards the base, very smooth, unequal at the base, and with an entire, somewhat revolute, margin, near which the anastomosing veins form one or two distinct wavy lines. A quantity of the leaves were collected for me about the middle of August by Mr. Henry C. C. Maisch, a fellow-student and class-mate, in the neighborhood of Cresson Springs, Pa. These were carefully dried, remote from heat and direct rays of the sun, powdered, and subjected to an examination which resulted in isolating the three constituents, according to Prof. Maisch, apparently characteristic for coriaceous leaves of ericaceous plants, viz., arbutin, ericolin and ursone; besides these principles, tannin, gallic acid, resin, wax, albumen, coloring matter and a trace of volatile oil were observed.

A portion of the powdered drug was subjected successively to the treatment of petroleum spirit, ether and alcohol, according to Dragendorff.

The solution in petroleum spirit was evaporated at the ordinary temperature; towards the close of the operation a pungent, peculiar odor, slightly irritating, was perceptible, possibly due to a little volatile oil; a soft, semi-solid, waxy mass, of a peculiar resinous odor, was left as a residue.

The ethereal liquid was allowed to spontaneously evaporate at the ordinary temperature, and the resulting residue was treated with water and filtered. The filtrate was found to contain gallic acid, by treating with acetic ether, separating and evaporating, when crystals were left which in solution darkened upon addition of solution of iron salt, but on being heated the color vanished; the liquid gave no precipitate with solution of gelatin.

The residue on the filter, after treating the ethereal extract with water, was composed chiefly of resin, associated with chlorophyll and other coloring matter.

The alcoholic tincture obtained by macerating the powdered leaves which had been previously exhausted by petroleum spirit and ether was evaporated to an extract, which was then treated with water and filtered.

The residue left on the filter was well washed and dissolved in hot alcohol, which on cooling deposited an apparently amorphous mass, ursonic; upon redissolving in alcohol, microscopic needles were obtained, which upon addition of sulphuric acid turned black, reddening the acid, and became yellow with nitric acid, giving off nitrous acid fumes.

The aqueous filtrate was concentrated, treated with acetate of lead, filtered, the filtrate freed from lead by sulphuretted hydrogen, concentrated to a syrupy consistence, again diluted somewhat, and treated with animal charcoal, then concentrated and set aside, when a deposit of acicular crystals was obtained, which proved to be arbutin. An alkaline solution of the crystals gave the sky-blue color with phosphomolybdic acid. Sulphuric acid dissolved them without change of color, but nitric acid turned yellow, with the evolution of nitrous acid fumes.

The precipitate obtained with lead acetate was suspended in water, the lead removed by sulphuretted hydrogen, the filtrate heated to expel excess of sulphuretted hydrogen, and treated with solution of gelatin, when a bulky precipitate was obtained, which, after washing with water, became black on the addition of an iron salt, thus showing it to be tannin.

A second portion of the leaves was treated with water, and the infusion boiled and strained, leaving a flocculent residue of albumen on the strainer. The clear liquid was then concentrated and treated with solution of acetate of lead, the precipitate separated by a filter, and the filtrate freed from lead by sulphuretted hydrogen; the filtrate was heated to expel excess of sulphuretted hydrogen, treated with animal charcoal to remove coloring matter, concentrated, and set aside, when crystals of arbutin were deposited, showing the reactions mentioned above.

The lead precipitates contained tannin and gallic acid, and some arbutin was extracted from the sulphide of lead, and obtained in crystals. The mother-liquors of arbutin seem to contain ericolin.

HOP EXTRACT.

BY WAYNE B. BISSELL, PH.G.

From an inaugural essay.

In discussing this subject the main object of the writer will be to bring to notice an extract of Hops made by an entirely new process and to compare that product with one made by myself, according to the directions given in the Dispensatory.

A very fine sample of late hops, which appeared rich in lupulin, was exhausted as thoroughly as possible with pure alcohol by percolation. The drug was then boiled in water for one hour, strained and washed. The alcoholic and watery extracts were evaporated at a very low temperature to a thick syrup and then mixed, and further evaporation carried on by means of a water bath until a product of nearly pilular consistence was obtained, in which condition the patent extract was. The product thus obtained, contained the aroma of the hop which is very easily destroyed by a high heat.

As far as could be learned, the process by which the patent extract is made on a very large scale is as follows:

The hops taken from the bale are run through a machine, which separates the scales from the axis without breaking them much. They are now placed in a large wire cage rather loosely, and three of these cages are run into an immense boiler or "extractor" as it is called, which holds about six hundred pounds of the drug. A heavy door then is shut and barred, making everything secure. About three hundred barrels of gasoline are now pumped in by the engine, when, by means of a steam coil, heat is applied until a pressure of one hundred pounds to the square inch has been attained. The object of this high pressure is to break or crush the little glands called lupulin, which contain the valuable principle, this being taken up by the hot gasoline. As soon as the above pressure has been attained, the steam is shut off and as the heat decreases, the hot gasoline holding the extract in solution is drawn off gradually into a large boiler or tank, and as it gradually cools, the extract settles to the bottom and the gasoline rising to the top is removed and used over again on a fresh portion of hops. In the meanwhile the extract and gasoline remaining in the extractor, have been completely washed out by super-heated steam and both separated as in the former case, so there is but very little waste of

menstruum. The extract in the boiler on cooling to a certain temperature, is drawn off and subsequently canned, in which condition it will keep for an indefinite period, a great advantage over the hop itself, which at the end of two years is nearly useless. One pound of this extract represents about twelve pounds of choice hops. About two thousand pounds of hops can be exhausted in these works during twenty-four hours. The only use made of this extract at present is in the manufacture of beer, for which purpose it is at present being used to a large extent in Philadelphia and New York, fully supplying the place of the ordinary hop.

On investigation quite a difference was observed between this extract and the one made by myself, the former being of an intense black color, appearing to be more oily, and containing practically no tannin or a mere trace, while in the extract made by myself between 7 per cent. and 8 per cent of tannin was indicated by using a solution of acetate of lead.

The amount of glucose was ascertained [by Fehling's solution, and found to be in my extract 12 per cent., but in the patent extract, a little over 16 per cent. During this investigation the writer obtained results more easily from the patent extract than from the extract made by himself.

On exposing the extract made by me to a temperature of 100°C. until it ceased to lose weight, 13 per cent. of volatile matter was expelled, and at 110° C. it lost an additional 9 per cent., becoming quite dry, darker in color, losing its aroma and breaking with little difficulty into small pieces. The patent extract exposed to 100° C. lost only .05 per cent. in weight and at 110° C., this loss was increased by only an additional .03 per cent. This high heat seemed to have but very little effect on it, either in changing its color, or destroying its odor.

The effect of different solvents on the two extracts showed a very marked difference. Water dissolved only a very small portion of the extract made by me, leaving a brown residue, which was apparently mostly resin and oil. Alcohol had only a slight effect, but dilute alcohol took up more. All of the ordinary solvents were tried, and none of them completely dissolved this extract.

The patent extract was found to be practically insoluble in water, and also in cold alcohol, but hot alcohol held it in solution as did also benzin. It is more soluble in ether and completely soluble in chloro-

form. It has a very strong and rather unpleasant odor, and its taste is exceedingly bitter. A further point of interest concerning this extract is, that when it is being drawn from the storing boiler into large cans, quite frequently small white crystals are seen, but it is impossible almost to separate them. The extract without purification, so as to free it entirely from the gasoline, could not be used internally as it creates nausea, but is quite frequently mixed with sugar and formed into cakes in which condition it is used to some extent.

In conclusion, the writer would extend his thanks to W. A. Lawrence, Superintendent of the works, through whose kindness he obtained the process of manufacture as given above.

SYRUPUS PRUNI VIRGINIANÆ.

BY J. GEORGE ENGLER, PH.G.

From an Inaugural Essay.

The bark from which this syrup is made is obtained from *Prunus serotina*, and collected in autumn. On the recent shoots it is green or olive brown, polished, and has minute orange dots; afterwards it becomes darker and on the small trunks and larger branches is of a reddish or purplish brown, with scattered, oblong, horizontal dots characteristic of the cherry. Old trunks have a scaly bark not unlike some of the pines.

The wild cherry tree rarely attains a height of more than forty or fifty feet in Massachusetts. According to Dr. Richardson it grows as far north as the Great Slave Lake, in latitude 62°, but only attains the height of about five feet. In Maine it rises to about thirty feet, being seldom more than a foot in diameter. In western New York it grows to a great height and a large size, but along the Ohio river it is seen in its perfection, for it is found from twelve to sixteen feet in circumference and from eighty to one hundred feet high. The trunk is of uniform size and undivided to the height of about twenty-five feet. The wood is of a light red color, growing darker with age, and its medullary rays are very numerous and more closely arranged than those of most other woods. It is especially valuable in cabinet work

and has of late years become very much in demand for fixtured in many pharmacies. The most beautiful portion commonly used is that where the branches begin. The bark is of a pleasant aromatic bitter, leaving, when chewed, an agreeable taste in the mouth.

The U. S. P. process for preparing syrup of wild cherry is unsatisfactory on account of the instability of the production and its liability to undergo fermentation. The remedy which suggested itself to me was the use of a quantity of either alcohol or glycerin. The object of my experiments has been to obtain a syrup that will remain permanent, under ordinary circumstances, with the smallest amount of these preservatives. To make a just comparison I first made a syrup according to the pharmacopœial formula. This syrup was made March 1st, 1884; it had a rich brownish red color, the characteristic odor of hydrocyanic acid, and a slightly bitter, astringent taste. Placed on a shelf where it was subjected to the ordinary conditions of light and heat of the store, after eight weeks a slight cloudiness was formed, followed by a noticeable amount of precipitate, and fermentation soon began. With this change the syrup began to lose its color, and after nine months had lost all resemblance to a good syrup in color and odor, and it also had a thick fungous growth at the top.

Three syrups were next made in which the glycerin was replaced by alcohol in different proportions, and three in which the quantity of glycerin was increased in different amounts. Those made with alcohol show the following results: Number one, with four drachms of alcohol to the pint, kept almost perfectly for three months, then a slight precipitate began to form, which, after nine months' standing, is quite noticeable; odor and color remain unchanged. Number two, made with one ounce of alcohol, remained unchanged somewhat longer, but a precipitate has formed. The color remains unchanged and the odor is slightly alcoholic. Number three, made with one and a half ounces of alcohol, remained permanent for a still longer time, color unchanged and a stronger alcoholic odor. The result of these three experiments with alcohol as a preservative show that this menstruum in practicable amounts is not satisfactory. The syrups made with increased quantities of glycerin showed the following results: Number four, with two ounces of glycerin to the pint, a bright syrup of beautiful color, and after standing nine months still remains unchanged. Number five, with two and a half ounces, and number six with three ounces

of glycerin to the pint, gave permanent, bright syrups. The syrup was made by the following formula :

Wild Cherry bark.....	℥v,
Bitter Almond.....	℥v,
Water.....	℥xxvi,
Glycerin.....	℥ii,
Sugar.....	℥xxiv,

Made according to the pharmacopœial method a handsome syrup is obtained, permanent, and having a strong odor and taste of hydrocyanic acid. These results show that glycerin in somewhat increased amounts would make the syrup permanent.

GLEANINGS FROM FOREIGN JOURNALS.

BY J. ROBERT MOECHEL.

Thorough Extraction of Vegetables.—A considerable quantity of water and sometimes application of heat is necessary for completely extracting tannin and coloring matters from plants. Dr. O. Kohlrausch, of Vienna, claims that a small amount of water is needed, and that very concentrated solutions are obtained at a low temperature, by operating as follows :

The material to be extracted is covered with water, and macerated for some time at a pressure of one atmosphere. The water penetrates the cellular tissue, dissolves the coloring matter, and, by way of diffusion, the water becomes saturated to the same degree as the liquid in the cells. Separating the liquid, and repeating the operation several times, under the same conditions, secures the complete extraction of coloring matter.—*Erfindungen und Erfahrungen, Wien, i, 1885.*

Ergot.—Dr. R. Kobert's interesting investigations show the presence in ergot of three physiologically active bodies—two acids and one base.

I. *Ergotic Acid*, being the principal constituent of the sclerotic acid of Dragendorff and Podwyssotzki. Its isolation depends upon its being precipitated by ammoniacal subacetate of lead.

II. *Sphacelic Acid* (from the old name of ergot, *Sphacelia segetum*). Its isolation depends upon the insolubility of the free acid in water, and its solubility in alcohol.

III. The alkaloid *Cornutine* is not identical with the crystallized nor with the amorphous ergotinine of Tanret ; it is readily soluble in alco-

hol, and is obtained from an alkaline aqueous solution by agitation with ether. This alkaloid is reported as being very poisonous.—*Pharm. Centralhalle*, 1884, p. 607.

Paraldehyd as a Reagent for Caramel, is recommended by Dr. C. Amthor, who finds that an alcoholic liquid containing caramel (rum, cognac, brandy, wines) gives, on the addition of sufficient paraldehyd, a brown precipitate, and becomes decolorized. Minute quantities of caramel may be detected as follows :

Mix 10 cc. of the liquid in a suitable tall vessel, or white glass medicine bottle, with from 30 to 50 cc. paraldehyd (according to intensity of color) and enough alcohol to obtain a uniform mixture; wine requires about 15 or 20 cc. of alcohol. After 24 hours, caramel will show its presence by a brownish to dark brown sediment, which adheres to the bottom; after washing it with a little absolute alcohol, dissolve the sediment with hot water, filter, and evaporate to 1 cc.; this residue will give an indication of the quantity of caramel present.—*Zeitschrift f. Analyt. Chemie*, 1885.

Sugar in Beet Root.—Girard shows by new assays that the formation of sucrose takes place in the margin of the leaves through the influence of the sunlight. During the night the sugar passes into the root, so that in the morning the leaf margins are free from sucrose, but retain a uniform quantity of reducing sugar.—*Journ. de Fabr. de Sucre*, 1884, pp. 25, 48; *Chemiker Ztg.*, 1885, p. 3.

Mixtura dentrificia.—

Oil of pepper mint (English).....	10·0
Oil of anise (French).....	4·0
Oil of star anise.....	4·0
Oil of Ceylon cinnamon.....	1·0
Oil of rose.....	0·5
Oil of cloves.....	2·0
Tincture of ambergris.....	2·0
Tincture of vanilla.....	10·0
Tincture of cochineal.....	25·0
Tincture of logwood.....	2·0
Tincture of orris root.....	6·0
Sugar.....	10·0
Alcohol	1 liter.

Digest for 24 hours, and filter.—*Gaz. Hebdom.*; *Pharm. Ztg.*, 1885, p. 5.

Paste of Squill as Rat Poison.—Melt in a suitable dish 4 ounces of

lard; add 8 ounces of squill, and a small onion, cut into minute pieces; digest, with continuous stirring, for about 15 minutes, and then mix with an equal quantity of mashed potatoes. When cool, add 20 drops of oil of anise. This paste is said to be very efficient.—*Pharm. Ztg.*, 1885, p. 6.

Ferrous iodide, dissolved in glycerin, does not undergo any alteration. The following formula is suggested by Sylvio Plevani:

Digest 20 Gm. iodine, 10 Gm. card teeth and 30 Gm. water; filter into a porcelain capsule, containing 75 Gm. of glycerin, and evaporate to 100 Gm.

This solution contains 23 Gm. of ferrous iodide, and, since it is miscible in all proportions with water, alcohol and syrups, and may also be incorporated with fats and oils, it is a preparation offering great convenience in dispensing.—*Bollet. Farmaceut.; Pharm. Ztg.*, 1885, p. 9.

Carbolic Acid.—The reddish tint which carbolic acid assumes seems to be frequently, but not always, caused by the presence of traces of iron, as shown by Hager. After purifying a red carbolic acid by distillation, he was not able to find any indication of iron, but concludes that the coloration may have been caused by compounds resembling corallin or tropæolin.—*Pharm. Centralhalle*, 1885, p. 1.

Pomegranate bark, according to Carl Julius Bender, contains but one crystallizable alkaloid and two amorphous bases. He discards the name Pelletierine in favor of "Punicine," and gives a process for the preparation of a stable crystallized sulphate.—*Pharm. Centralhalle*, 1885, p. 6.

Aconitine has a reducing action on salts of silver and mercury, by which it may be recognized, according to Hager.

On dissolving 0.02 or 0.03 Gm. aconitine in 3 to 4 cc. alcohol, and adding a few drops of solution of nitrate of silver, instantaneous reduction takes place, which action may be accelerated by heat. The drops falling into the aconitine solution cause turbidity and a brownish color. More than traces of other salts, especially alkalies, prevent the reduction until after repeated boiling. The scaly aconitine of commerce seems to have been obtained by spreading an alcoholic solution on glass plates.—*Pharm. Centralhalle*, 1885, p. 6.

Reaction of Chloral Hydrate.—If calcium sulphhydrate, $\text{Ca}(\text{SH})_2$, is added to a solution of chloral hydrate, the liquid assumes a red color. The reaction is less delicate, but still distinct, if H_2S and then CaHO

is added to the chloral hydrate, and after a minute the liquid assumes a pink color.—*Arch. d. Pharm.*, vol. 223, p. 26; *Ph. Centralh.*, 1885, p. 6.

Antiseptic Vinegar, in place of “*Vinaigre de Toilette*.”—

R	Aetheris aceticæ.....	8·0
	Acid. acetic. conc.....	120·0
	Tinct. eucalypti globuli.....	60·0
	Aquæ coloniense.....	960·0

—*Der Fortschritt*, No. 2; *Ph. Centralhalle*, 1885, p. 6.

Vapor of Glycerin for Cough.—M. Trastour has employed, with great advantage, the vapor of glycerin for alleviating distressing or frequent cough, irritation of the throat, etc.

About 50 or 60 Gm. of glycerin are heated in a porcelain capsule, and the vapor, which is copiously disengaged, is breathed by the sufferer. Carbolic acid dissolved in glycerin may also be employed.—*Gaz. Méd. de Nantes*.

Detection of Copper and Lead in Wine.—Hager recommends mixing the suspected wine with $\frac{1}{4}$ or $\frac{1}{2}$ volume of clear liquor sodæ, when the mixture should remain clear even if boiled; a colored turbidity would indicate the probable presence of copper. Put 6 cc. of the clear mixture in a test-tube and introduce a piece of tin foil, which should be entirely covered by the liquid; warm in a water-bath for about $\frac{1}{2}$ or 1 hour. If the wine be free from lead and copper, the tin foil will remain glossy; slight traces of these metals cause the tin foil to lose its lustre, and to become grayish; in the presence of more than traces of these metals the tin foil will become dark gray to dark grayish black (lead); dark steel colored, brown or brownish black (copper). Boiling will accelerate the action. Presence of zinc or arsenic will not interfere with the above reaction.—*Ph. Centralhalle*, No. 8, 1885.

A delicate test for nitric acid is recommended by Prof. Uffelmann: Add to a small piece of diphenylamine, of about the size of half a lentil, placed in a porcelain capsule, 1·5 cc. H_2SO_4 , which must be absolutely free from NO_2 and HNO_3 ; stir with a glass rod until a very pale pink color is produced, and add 3 or 4 drops of the liquid to be tested, on the border of the capsule. Much HNO_3 will instantaneously cause the appearance of a bluish line, extending like a cloud. Slight traces of HNO_3 give that line, after a short while, mostly within a minute, and this line also extends and becomes more intense. The

proportions given are essential to success; the test is more delicate than that with brucine.—*Pharm. Ztg.*, No. 14.

Syrup of Pineapple.—Cut 5 kilos of selected pineapples in small pieces, transfer into a bottle, add 5 kilos each of white wine and water, and macerate at a medium temperature for several days. Boil 30 kilos of sugar with 20 kilos of water, add the strained infusion, heat to ebullition, and strain through flannel.

Syrup of Apricot.—Digest, for six days, 5 kilos each of white wine, water and ripe apricots, freed from stones and cut into small pieces; strain, press very gently, and add to the hot syrup, prepared as above of 40 kilos of sugar and 30 kilos of water. When cold, add 200 Gm. of artificial essence of apricots.—*Erfind. und Erfah.*

Shoe Blacking.—Mix 100 parts bone black, 50 parts glycerin, 5 parts oil and 10 parts of vinegar. This blacking is said to give excellent shine, and to keep the leather smooth and soft.

Transparent Glue for Porcelain.—Dissolve 75 Gm. caoutchouc, in small pieces, in 60 Gm. of chloroform; add 15 Gm. of mastic, and dissolve without heat.—*Chemiker Ztg.*, No. 14, 1885, p. 254; *Nature*, 1884, xii, p. 587.

REACTIONS WITH CARBON AND SOME OF ITS COMPOUNDS.

BY G. GORE.

When white or red phosphorus, or powdered arsenic or antimony or sodium, are added to fused potassium cyanide; or when aluminium or sodium phosphide, or a mixture of sodium phosphide with zinc, is added to fused potassium and sodium carbonates; or when sodium carbonate is decomposed at a low red heat by phosphorus vapor; or when a mixture of red phosphorus and ammonium carbonate is dropped into a red-hot porcelain crucible, a black substance separates, which in some cases is found to be carbon. Carbon is also obtained when coal-gas is passed over red-hot finely powdered ferric oxide, or over just fused argentic fluoride or chloride, or over chloride of lead or copper. Arsenic and antimony do not visibly decompose fused sodium and potassium carbonates; neither is carbon set free when ammonium carbonate is added to fused sodium; nor when coal-gas is passed over fused cadmium chloride or silver iodide; nor in several experiments wherein numerous hydrocarbons, in various solvents, were exposed to metals and metallic couples. Several unsuccessful attempts at deoxi-

dising carbonic anhydride are also described along with many experiments wherein many substances alone and in contact were immersed in various solutions of metallic salts containing carbon in combination, and in these solutions when exposed to carboniferous vapors, but in all cases without any deposition of carbon. The chlorides of carbon proved equally useless as sources of carbon, even resisting the influence of potassium, which, however, formed an alkaline salt with carbon tetrachloride; potassium or sodium, dissolved in anhydrous liquid ammonia at 60° F., behaved in a similar manner with carbon bromide and sulphide and with anhydrous sodium carbonate or formate, or ammonium oxalate. On passing dry ammonia gas into liquid carbon dichloride containing potassium, gas was evolved, and a red powder formed; with naphtha instead of the chloride, the potassium only became red. Carbon is insoluble in anhydrous liquid cyanogen, sulphuric chloride, phosphorus trichloride, antimony pentachloride, anhydrous liquid hydrofluoric and hydrochloric acids; chlorides of carbon and bisulphide of carbon were also found to be insoluble in the last two acids, but they are soluble in liquid cyanogen. Many experiments with carbon bisulphide are described; for example, when silver and platinum in contact are immersed in it, after some time the silver blackens; in the same way lead and mercury yield a black powder soluble in nitric acid. Thallium also blackens, but no action could be observed with tin, or magnesium and platinum, or with boron fluoride; tin tetrachloride, thallium chloride and cyanogen are dissolved by it, and it precipitates mercuric chloride from its solution in ether. The solutions of sulphur and phosphorus in carbon bisulphide give no reaction when exposed in an atmosphere of carbonic anhydride; zinc remains bright in the sulphur solution and potassium and platinum in contact cause no free carbon to separate from it; aluminium and magnesium become dull, but are not corroded by prolonged exposure in the phosphorus solution. When a solution of silver nitrate with a piece of platinum partly immersed in it was exposed to carbon bisulphide vapor continuously for seven weeks, all the silver was precipitated; magnesium, aluminium or silver partly immersed in water exposed to the same vapor, were unaltered; when, however, the silver was in contact with platinum, the liquid became dark and the silver above it blackened. A liquid which dissolved selenium was obtained by passing the vapor of selenium over charcoal powder kept at a full red heat.—*Chem. News*, vol. 50, pp. 124-126; *Jour. Chem. Soc.* 1885, p. 119.

NEUTRAL OLEATE OF MERCURY.¹

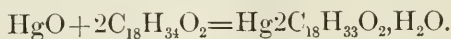
BY CHARLES R. C. TICHBORNE, L.L.D., F.I.C., ETC.

Attempts have been made to make the mercurial oleates by double decomposition, but my experience is that it is not attended with much success. This is in great measure owing to the fact that when the salts (let us say mercuric chloride and oleate of sodium) in the proportions to form the *neutral* oleate are brought together, very little of the oleate is formed, and it is next to impossible to work the product properly. If we double or halve the equivalent of oleic acid so as to get an acid or basic salt the product is much larger. It is the acid oleate which has generally been formed in the double decomposition process.

Assuming that oleic acid is what is termed a monobasic acid, the neutral mercuric oleate should have the following composition :



We find that mercuric oxide (either the red or yellow oxide) dissolves in the proportions requisite to produce a neutral salt forming a colorless and fairly homogeneous mass. If this be placed under the microscope, however, indications of the separated water may be perceived. This water, which is produced by the decomposition, has, I think, frequently been lost sight of in considering the oleates. The reaction is as follows :



If we allow oleate of mercury to stand, however, some considerable time, this water seems to be assimilated, and a hydrate is formed. The oleate pectises, and the colloid oleate, if diluted with vaseline and placed under the microscope, is seen in jelly-like masses disseminated through the element. It is mixed with some little difficulty. If the oleate is gradually heated upon a water-bath to 100° C., the water is very slowly given off, and long before the theoretical quantity is lost, the oleate begins to decompose. The acid being oxidized and metallie mercury deposited, if this reaction be pushed to its ultimate results, a dark-colored liquid oil is produced and metallie mercury. The fusing point of mercuric oleate is two or three degrees above the boiling point of water.

¹ From the "Medical Press," September 24, 1884.

It begins to slowly decompose at this temperature, therefore the mercuric oleate should be formed in the cold. No heat should be used, and an excess of oleic acid is not only unnecessary, but detrimental to its keeping properties. Free oleic acid has a tendency to change to an irritating oxy-oleic acid, which it does at the expense of the mercuric oxide, as evidenced by the production of the metallic mercury. It may be made either from the red or yellow mercuric oxide, and although the yellow is specified in the existing formula, finely levigated red oxide will be found preferable, using equal proportions, viz., $2\frac{1}{2}$ parts of mercuric oxide for every 5 parts of the best commercial oleic acid. It does take a little trouble to form the mercuric oleate by the direct action of the oxide upon the acid, but if we possess machinery the process is rendered comparatively easy. It would be almost impossible to make this preparation were it not that, as already explained, mercuric oxide forms both basic and acid compounds. This fact shortens the process, which consists really towards its conclusion in getting a semi-solid substance (the acid oleate first formed) to act chemically upon the remaining oxide.

The keeping and non-irritant properties of the resulting *neutral* oleate will repay the trouble spent in the manipulation.—*Pharm. Jour. and Trans.*, January 17, 1885, p. 576.

PILOCARPUS.—Dr. Sidney Thompson has for several years been treating erysipelas locally with the fluid extract of jaborandi, and usually in the following prescription :

R	Jaborandi fluid extract.....	24	grams
	Glycerin.....	4	"
	Laudanum.....	4	"
M.	Sig. Paint with a feather every four hours.		

The glycerin is necessary, as the jaborandi has a tendency to produce a desquamation if used alone; the laudanum is added simply to relieve pain. *Therapeutic Gazette*, Nov., 1884, p. 504.

Dr. W. W. Claybaugh has used a similar mixture, increasing the laudanum and glycerin each to 12 grams, and reports favorable results in erysipelas, in inflammation caused by croton oil, and in severe scalding of the hand by a boiling liquid; in the latter case the inflammatory action was totally prevented.—*Med. and Surg. Rep.*, Feb. 7, 1885, p. 188.

THE DEVELOPMENT OF COLOR IN LIQUOR CALCIS SACCHARATUS.¹

BY JOHN R. HILL.

The gradual development of a yellowish-brown color in the official liquor calcis saccharatus attracted my attention a few years ago. I did not at that time attempt to ascertain the cause of the phenomenon, my inquiries being rather directed to the point of ascertaining whether or not the coloration was accompanied by any deterioration in alkalinity. With this view I made estimation of freshly prepared liquor and of the same after being allowed to stand until considerably colored. On comparing the two results, they were found to indicate only a very slight deficiency in the colored liquor. It was, therefore, concluded that, practically the coloration was of very little consequence.

The subject was again brought under my notice recently by a request to furnish an answer to the query, What causes the coloration of liquor calcis saccharatus, and how may it be prevented? Being at the time engaged in the preparation of our usual stock quantity of the liquor, I embraced the opportunity of making a few observations.

The British Pharmacopœia directs the clear solution to be decanted from the sediment; but it has been my usual practice to filter off after allowing to stand for twelve hours. Following the latter method, the clear liquid which passes rapidly through the filter was kept separate. The sedimentary portion, of course, filtered more slowly, and on comparing the two liquids I was a little surprised to find that the latter was considerably deeper in color—a fact which is explained further on. Squire states that the fresh liquor is colorless, but gradually acquires a brownish color. Neligan states that it is transparent, but possesses a slight yellowish tint. The latter appears to be the more correct statement, my experience being that from the first, the liquor is of a very pale straw color.

In attempting to answer the above query, the first thing done was to ascertain if there were any published results on the subject; but a rapid glance through all the availing literature goes to show that the point has not been previously investigated. A series of experiments were then made to determine the respective effects of the three agencies—light, heat and exposure to the atmosphere.

¹ Read at a meeting of the North British Branch of the Pharmaceutical Society, January 14, 1885.

1st. *Action of Light.*—To ascertain the effect of light, a bottle was filled quite full, securely corked, and exposed to direct sunlight for three weeks. A second bottle similarly filled and corked was kept during the same period in total darkness. On comparing the two liquids at the end of this time, hardly any development of color had taken place, and the difference between the two was barely perceptible, the one exposed to sunlight being, if anything the lighter of the two. It would, therefore, appear that light does not cause the coloration.

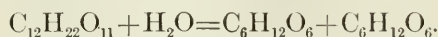
2d. *Action of Heat.*—A portion of the liquor was then gradually heated to the boiling point. This causes the separation of a bulky precipitate consisting of a compound having the formula $(\text{CaO})_3\text{C}_{12}\text{H}_{22}\text{O}_{11}$, which immediately re-dissolves on cooling, the resulting solution being almost absolutely colorless. This seems to indicate that heat is not the cause of the coloration. I am inclined to think that the boiled liquor is chemically different from the original, the union between the lime and the sugar being probably more intimate. Wood and Bache give a formula for syrup of lime prepared by triturating 400 grs. of well-burned lime with 3200 grs. of cane sugar, adding to this 8 oz. of boiling water, boiling for five minutes and filtering. It is possible that such a preparation would be less liable to colorize than the British Pharmacopœia preparation. It may be worth noting here that in old highly colored samples of liq. calcis sacch. the precipitate produced on boiling was only very slowly and not completely re-dissolved on cooling, the quantity of insoluble matter being apparently proportionate to the depth of color.

3d. *Action of Air.*—Exposure of the liquor to the action of the air was next investigated. A 1-ounce bottle was half filled with the liquor and allowed to stand in direct sunlight for three weeks, being repeatedly shaken and uncorked during the interval. Under these circumstances coloration gradually took place, and on comparison with a similar bottle kept in the same position, but quite full and well corked, the latter was found to be practically unchanged, while the former was of a decided yellow color, tending to brown, but still quite free from deposit. The same experiment was repeated with bottles kept in total darkness, and the results were precisely similar. I observed that some of the liquor had exuded by the cork from the full bottle kept in the dark and formed a solid crust, which was transparent, of a deep brownish-yellow color, very glutinous, having a strong styptic taste and an alkaline reaction. A 6-ounce bottle was filled two-thirds full and

allowed to stand undisturbed for a fortnight. On examination at the end of that period, it was found that on the surface of the liquid, where it was subjected to the influence of the air, there was a highly colored stratum about 1 inch deep, while the rest of the liquor remained unaltered.

These experiments appear to prove that the development of color in liq. calcis sacch. is due entirely to exposure to atmospheric air, and that light and heat are not concerned in the action. This explains the fact, already mentioned, that the second portion of the filtrate, which was longer exposed to the air, was more highly colored. I have made an extensive series of experiments with a view to determine the nature of the chemical changes to which the coloration is due, but owing to the very limited time at my disposal, these are very incomplete and inconclusive, and would require considerable verification. With that proviso I give a few results which may be taken for what they are worth.

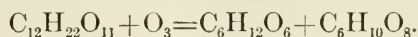
It is well known that a solution of cane sugar when allowed to stand becomes partially changed into grape sugar and levulose according to the following equation—



By the action of the alkalis, grape sugar is rapidly decomposed with production of a deep brown color, and my first idea was that this reaction explained the coloration. A portion of the liquor was precipitated by passing a stream of carbonic acid gas which, by the way, only slowly separates the lime. The whole of the coloring matter was thus precipitated, and on testing the clear solution with Fehling's reagent no reduction took place, indicating absence of grape sugar. On this point I have more to say presently. My next idea was that possibly the coloration might be due to production of amorphous sugar which, as is well known, gives the yellowish-brown tint to the mother liquor or golden syrup of the sugar refineries. To test this theory, a small proportion of golden syrup was added to a portion of the fresh liquor, which was allowed to stand for some time and then precipitated by a stream of CO_2 . Under these circumstances the coloring matter was not precipitated, and the amorphous sugar theory was therefore abandoned. On reconsidering my first theory it occurred to me that the reason why I did not discover grape sugar in the liquor, was that it had been decomposed by the alkaline solution as rapidly as it had been formed. Two grains of impure grape sugar were added to 1 ounce of

freshly made liq. calcis sacch., and after standing for twelve hours, the solution was found to be more highly colored than a sample of liquor which had been made for eighteen months and kept under conditions favorable to the development of color. In a similar experiment with pure grape sugar, the liquor, also acquired in a short time a distinct yellow color, but not nearly to the same extent as with impure grape sugar. The next point to be determined was an explanation of the relationship between exposure to air and the development of color in accordance with the grape sugar theory. It was found that after boiling and filtration the clear liquid from which the lime had been precipitated by CO_2 still contained some lime in solution which could not be precipitated by CO_2 , and was apparently combined with an organic acid. This acid might be readily isolated by acidifying with H_2SO_4 and distilling, but time would not allow of this being done, and consequently my statements in regard to it are mainly speculative and suggestive.

The fact that contact with the air is necessary for the development of color, in the liquor points to the conclusion that it is due to some process of oxidation. It seems probable that grape sugar and an organic acid are produced, and I find that one molecule of cane sugar and three atoms of oxygen give one molecule of grape sugar and one molecule of saccharic acid, according to the following equation—



Then grape sugar, in contact with solution of lime, has been found to be gradually changed into glucic acid. By absorption of oxygen from the atmosphere glucic acid becomes transformed into aploglucic acid, which is an amorphous substance having a deep brown color, and this may be the cause of the coloration.

I have observed that the deposit found in liq. calcis sacch. which has stood for some time does not effervesce, or only very slightly on the addition of hydrochloric acid. This fact may be explained by the theory that the cane sugar is transformed in the usual way into grape sugar and levulose. Levulose is known to form an insoluble lime compound, which may constitute the deposit in question, the subsequent decomposition of the grape sugar by the lime producing the color. Formic acid is known to be produced in solutions of sugar in contact with air and the addition of ferric chloride to the clear liquid from which the lime had been precipitated certainly gave the red

coloration characteristic of the salts of formic acid. I am inclined to believe that the first step in the development of color is the formation of grape sugar, but beyond that point these speculations are, I feel, very problematical, but may assist in the further elucidation of the subject. It was found that the lime was entirely precipitated from freshly made liquor by CO_2 , with the exception of a small proportion due to the presence of chloride in the calcic hydrate, thus supporting the theory that the lime which is not precipitated from old samples is held in solution by an acid produced by the oxidation of the sugar. A very small proportion of grape sugar is sufficient to produce all the color found in samples kept as long as eighteen months, and this accounts for the very slight difference found to exist between the alkalinity of colorless and colored samples. From a practical point of view, therefore, the coloration is not of any great consequence.

With regard to the latter part of the query, namely, How may the development of color be prevented?

This may be the most effectually done by storing the liquor in bottles quite full and securely corked. This investigation goes to show that to prevent coloration the liquor *should not* be filtered, but decanted or syphoned off, as directed in the British Pharmacopœia. I observed that no less authorities than Roscoe and Schorlemmer erroneously state that the solution should be filtered. The liquor can be very readily prepared, and coloration will also be prevented by avoiding the error of making too large a quantity at a time. So far as I know, liquor which has become colored cannot be decolorized. I have tried digestion with animal charcoal, but without effect.—*Pharm. Jour. and Trans.*, January 24, 1885, p. 595.

EUCHLORINE AS A DISINFECTANT.—T. Hatfield Walker, L. R. C. P., in the "Lancet," says: Each molecule of *euchlorine* sets free four atoms of oxygen in the nascent condition, and is probably the most powerful of its class. The free chlorine that it contains doubtless, also, contributes to its efficacy. Euchlorine is a mixture of free chlorine, or chlorine very loosely combined with chlorous oxide, and is prepared by pouring strong hydrochloric acid on potassium chlorate and applying a gentle heat. He placed a small basin containing the chlorate in a large one full of boiling water, and on pouring in the hydrochloric acid the euchlorine was freely given off. The practical experience of several years' use in all cases of fever fully bore out the theoretical experiments, that in euchlorine we have a cheap, simple and effective disinfectant.—*Quarterly Therap. Review*, Jan., 1885.

THE DETERMINATION OF ETHYL NITRITE IN THE SPIRIT OF NITROUS ETHER AND KINDRED PREPARATIONS.

BY ALFRED H. ALLEN.

During many months past I have been engaged at intervals on a series of experiments with a view of estimating the proportion of ethyl nitrite and other nitrous compounds contained in sweet spirit of nitre. In the course of the investigation I have tried nearly all the published methods of assay,¹ and have obtained results of which the following description is an epitome:

The British Pharmacopœia test for the presence of nitrous compounds in the spirit of nitrous ether is a satisfactory one from a qualitative point of view, but it can be applied in a more advantageous manner than is directed in the British Pharmacopœia by mixing the sample with a strong aqueous solution of ferrous sulphate, and then pouring concentrated sulphuric acid down the side of the tube in such a manner as not to mix with the lighter liquid. A deep brown zone will be produced at the junction of the two strata, which, in the case of good samples, becomes intensified by cautious agitation.

Many samples of spirit of nitrous ether give a brown color with ferrous solution before the addition of acid, but the coloration is

¹The literature of spirit of nitrous ether is somewhat extensive. The following is a list of references to it in comparatively recent volumes of the "Pharmaceutical Journal:"

T. Redwood [3], viii, 377, 455.

J. Attfield [3], viii, 454.

F. W. Rimmington [3], viii, 341, 362, 377; x, 41, 220.

J. Williams [3], viii, 441, 453.

W. Smeeton [3], x, 21.

A. Dupré [3], x, 93.

J. Muter [3], x, 94.

W. Pollard [3], x, 100.

J. F. Eykman [3], xiii, 63.

W. H. Symons [3], xiv, 251.

U. S. and German Preparations [3], xiv, 101.

D. J. Leech [3], xiv, 322.

A. C. Abraham [3], xiv, 390, 876, 915.

P. MacEwan [3], xiv, 817, 826, 896, 936.

D. B. Dott [3], xiv, 819, 826, 895; xv, 200, 492, 592.

T. S. Dymond [3], xv, 101.

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always considerably enhanced by the sulphuric acid, and strong acid is far preferable to dilute.

I have tried the experiment of shaking a sample of spirit of nitrous ether with neutral sodium carbonate, filtering, and testing the filtrate with a solution of ferrous sulphate without adding acid. No reaction was at first produced, but the brown color gradually developed, and after a few minutes was very intense.

The iron test has the great advantage of really indicating the presence of nitrous compounds instead of leaving their existence to be inferred from some such fallacious reaction as the decoloration of permanganate. No doubt the permanganate processes of assaying spirit of nitrous ether are capable of giving useful comparative results in the case of samples of good quality, but when applied to inferior samples, or to specimens containing much aldehyde (such as the London Pharmacopœia preparation), the indications are utterly worthless and misleading, and the results should on no account be expressed in terms of nitrous ether.¹

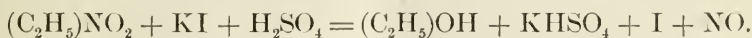
The well known process of Prof. J. F. Eykman for assaying spirit of nitrous ether is practically a quantitative application of the iron reaction, but, instead of relying on the depth of the brown coloration, the nitric oxide gas evolved is collected and measured. Eykman's process has given excellent results in the hands of Messrs. P. MacEwan and F. S. Dymond, and Mr. D. B. Dott has confirmed the general accuracy of the process, and has found the results very constant, even when the conditions of the experiment are varied. Their reports have been confirmed in the main by an extensive experience of its capabilities in my own laboratory, where the accuracy of the process has been fully verified when a known quantity of pure sodium nitrite (made from silver nitrite) is employed. With solutions of ethyl nitrite several sources of error exist, which tend to cause the method to give results somewhat below the truth. The chief cause of error is probably incomplete reaction, but the solubility of nitric oxide in aqueous liquids also affects the results. The loss from the latter cause is reduced to a minimum if a nitrometer be employed instead of the gas being caused to bubble up through a solution of soda. Probably still

¹ A sample of sweet spirit of nitre, which gave only faint indications of nitrous compounds when independently examined by the iron test by four different chemists, was reported by another chemist to contain 1.3 per cent. of nitrous ether, as the result of an analysis by Muter's modification of the permanganate process.

closer results might be obtained by saturating the soda solution with common salt.

Although, up to the present time, Eykman's process has been rightly regarded as that furnishing the nearest approach to accuracy in the assay of spirit of nitrous ether and kindred preparations for ethyl nitrite, I believe the following method will practically replace it in the future. It suggested itself to me when attempting to estimate ethyl nitrite by the process of Mr. D. B. Dott ("Pharmaceutical Journal," [3], xv, 200, 492, 592), which consists in treating the sample with an acidulated solution of potassium iodide, and estimating the nitrous compounds from the amount of iodine liberated, as ascertained by titration with decinormal solution of sodium thiosulphate. It is evident that the ethyl nitrite may be estimated either from the amount of iodine set free or from the volume of nitric oxide evolved in the reaction, the former being Dott's method, and the latter the one to which I now desire to call attention.

The assay might no doubt be made in an apparatus similar to that employed by Eykman, but I have found the following method of manipulation far more simple and satisfactory in every sense. It is the outcome of a large number of experiments made to test the constancy of the results under different conditions of operating. A nitrometer should be filled with strong brine and 5 cc. of the sample to be tested should then be placed in the cup of the nitrometer, and allowed to enter through the tap, taking care that no air gets in at the same time. Five cc. of a strong solution of potassium iodide is next allowed to enter, and this is followed by about 5 cc. of dilute sulphuric acid. Effervescence immediately ensues, and if the tube be vigorously agitated at intervals,¹ the reaction is complete in five minutes, when the level of the liquid in the two limbs of the nitrometer is adjusted, and the volume of nitric oxide gas read off. If the volume of gas evolved be small, another 5 cc. of the sample should be let into the nitrometer, and the agitation repeated. The calculation is the same as in Eykman's process, the reaction being:



Thus, 75 parts by weight of ethyl nitrite evolve 30 of nitric oxide

¹ This should be effected by holding the tapped tube vertically and agitating the contents by a transverse motion. In this way the reaction is readily confined to the upper part of the liquid in the closed side of the nitrometer.

gas. When strictly accurate results are not required, the volume of gas need not be corrected for variations of pressure, temperature, and tension of aqueous vapor, and if these considerations be omitted the calculation is much simplified. Thus, if 0.030 gram of nitric oxide (representing 0.075 gram of $\text{C}_2\text{H}_5\text{NO}_2$) under the *ordinary* conditions of pressure and temperature be taken to measure 23.55 cc., then

$$\frac{\text{volume of gas in cc.} \times 0.3185}{\text{measure of sample in cc.} \times \text{density of sample}} = \text{percentage by weight of } \text{C}_2\text{H}_5\text{NO}_2.$$

If the density of the sample be omitted from the equation, the result will be the number of grams of ethyl nitrite per 100 cc. of the sample.

The nitrometer method has been proved to give very good results with pure sodium nitrite (prepared from silver nitrite) employed in known amount. The results with spirit of nitrous ether are somewhat higher than those given by Eykman's method, the difference being least when sodium chloride is employed in the latter process and time given for the ferrous solution to react thoroughly on the solution of ethyl nitrite. The results by the iodide method are almost certainly more accurate than those by Eykman's process. With most specimens of sweet spirit of nitre, a considerable amount of nitric oxide is produced (and iodine liberated) before adding the acid, the reaction probably depending on the presence of free acid in the sample. The results obtained in the nitrometer are remarkably constant, and the method furnishes a very easy means of assaying sweet spirit of nitre with considerable accuracy, which is further increased if a correction of 1.5 cc. (= 0.0048 gram of $\text{C}_2\text{H}_5\text{NO}_2$) be made for solubility of the gas. The process has the advantage of great ease and rapidity, and actually measures the nitrous compounds present in the sample, instead of leaving their proportions to be inferred from a more or less complex reaction, such as the reduction of permanganate, etc. The following results were obtained by me from six typical samples. No correction was made for pressure or solubility, the figures representing the actual volumes of gas measured at about 15° C.

	Volume of NO from 5 cc.	Weight of NO from 5 cc.	$\text{C}_2\text{H}_5\text{NO}_2$ per cent.
	cc.	Milligrams.	
1. 25 per cent. sol. in absolute alcohol (two months old).....	290.0 from 0.5 cc.)	923.6	22.02
2. Spt. Nitrous Ether B. P. (two months old).....	39.4	50.1	2.98
3. Spt. Nitrous Ether B. P. (age unknown).....	27.0	31.6	2.63
4. Spt. Nitrous Ether B. P. (age unknown).....	34.8	41.3	2.62
5. "Spt. Ether. Nit. 850" (new).....	14.7	18.8	1.10
6. Sp. Ether. Nit. Dule. "900" (new).....	22.0	28.2	1.56

No. 1 sample was prepared by Mr. J. Williams by dissolving one part by weight of carefully purified ethyl nitrite in three parts by weight of absolute alcohol. The density was $\cdot 8387$. With corrections for solubility, pressure and temperature, the ethyl nitrite shown by the process in this specimen came to nearly 24 per cent. As the sample at the time of examination had a sensibly acid reaction, indicating slight decomposition, I believe the corrected result to express with considerable accuracy the actual composition of the sample. Another solution of ethyl nitrite in absolute alcohol which I have had for upwards of seven years, still contains a notable quantity of nitrous ether.

No. 2 sample was the ordinary commercial B. P. article, prepared by Messrs. Rimmington and Son, of Bradford. It gave 1 per cent. of ethereal layer by the chloride of calcium test.

Nos. 5 and 6 were analyzed immediately on opening the bottles, as freshly sent out by the wholesale house, which is one of the first reputation. I have analyzed them again, after an interval of a month, and find that 5 cc. yielded respectively 14.4 and 22.3 cc. of nitric oxide, measured at the ordinary temperature of the laboratory. Hence they were practically unchanged, though kept in a warm room.

I have also employed the process for the assay of a considerable number of other commercial samples, and it has given me every satisfaction.

The nitrometers commonly sold are furnished with three-way-taps, but for the purpose in question this is unnecessary, an ordinary tap being sufficient. A nitrometer-tube, which I have had made for me, holds 50 cc. The cup is narrow and cylindrical, and has marks at 5 and 10 cc. above the tap. This arrangement renders the use of a pipette or other separate measuring arrangement unnecessary, as the cup can be filled to the 5 cc. mark with the sample, and thus a definite amount taken for the analysis.¹

With the aid of such a nitrometer, the assay of spirit of nitrous ether for ethyl nitrite and other nitrous compounds is reduced to an operation of the utmost simplicity, and literally does not require more than ten minutes for its completion, including the necessary calculation. The results are as constant as can be desired, and the process as near an approach to accuracy as is required for ordinary purposes. I believe

¹ Messrs. Cubley and Preston, of High Street, Sheffield, are now prepared to supply these nitrometers to those desirous of employing the process mentioned in the text.

it will afford the pharmacist or medical man a valuable means of assaying his sweet spirit of nitre, requiring as it does no out of the way reagents, or even a standard solution.¹

In the course of the experiments made in testing the foregoing process, in many instances I observed the amount of nitric oxide set free simply by agitation with iodide of potassium, without any acid being added. It might be supposed that the gas given off at this stage of the process was that derived from the free nitrous acid of the sample; but I do not think this is strictly the case, as in experiments in which acetic acid was substituted for dilute sulphuric acid, nearly, if not quite, the whole procenable gas was evolved. Hence a sample which by decomposition contained free acetic acid would evolve nitric oxide, though no nitrous compound other than ethyl nitrite were present.

With regard to Dott's titration process, if the treatment with potassium iodide be effected in an open basin in presence of air, the amount of nitrite found is liable to be seriously in error; but if air be excluded Dott's method gives fair approximate results, somewhat in excess of the truth. The process can be advantageously employed on the solution which has already been decomposed with potassium iodide in the nitrometer. The nitric oxide is allowed to escape into the air, and the brown liquid is washed into a basin, and at once titrated with decinormal thiosulphate. 1 cc. of this solution (containing 24.8 grams of crystallized $\text{Na}_2\text{S}_2\text{O}_3$ per litre) will react with the iodine liberated by .0075 gram of ethyl nitrite.

The results obtained in this manner show a constant difference of about 0.005 gram of nitric oxide above that corresponding to the volume of gas liberated in the nitrometer, the true amount doubtless lying between the two. The difference is most probably due to a small amount of nitric oxide remaining dissolved in the aqueous liquid, which causes the volume of gas to be slightly low, and becoming oxydized to nitrous acid during the subsequent titration liberates a small additional amount of iodine. This source of error becomes very

¹The use of brine, in the nitrometer, instead of mercury, renders the manipulation more simple, without appreciably affecting the accuracy of the results. The nitrometer itself may be extemporized from an inverted Mohr's burette, to the nose of which a short, wide, glass tube has been fitted by means of a perforated cork. The open end of the burette is also fitted with a cork, through which passes a short length of glass tubing which is connected by narrow india rubber tubing with a wide glass tube or funnel to serve as a reservoir.

serious if the bulk of the nitric oxide be not previously removed, as is done in the nitrometer. Thus, if an attempt be made to determine ethyl nitrite by adding the sample of spirit to an acidulated solution of potassium iodide contained in an open basin, and immediately titrating with standard thiosulphate, the first result is too low, owing to the nitrous ether requiring a sensible time for its decomposition. In a few minutes this error is more than compensated by the additional amount of iodine set free by the nitrous acid produced by the action of the air on the nitric oxide formed in the primary reaction, and this liberation of iodine goes on so rapidly that the stirring necessary to mix the standard solution with the liquid in the basin causes the solution again to acquire a yellow tinge, which rapidly deepens. If the liquid in the basin be allowed to stand for some time exposed to the air before titrating, as is recommended by Dott, the iodine set free often amounts to fully twice the quantity primarily liberated by reaction with the ethyl nitrite present.

I have to thank Messrs. Dott, Dymond, Leech, MacEwan, Rimmington, Williams and others for information and samples connected with my experiments, and Mr. J. H. Worrall for assistance in the manipulations.—*Phar. Jour. and Trans.*, Feb. 21, 1885, p. 673.

EXAMINATION OF SOME OLD SPECIMENS OF SWEET SPIRIT OF NITRE.¹

BY PETER MACEWAN.

At an Evening Meeting of the North British Branch of the Pharmaceutical Society, held January 14, 1858, Mr. Jacob Bell, then President of the Society, in the chair, a paper on "Methylated Spirit" was communicated by Mr. J. F. MacFarlan.² This paper embodied "a report on the manufacture of sweet spirit of nitre from methylated spirit by Mr. Phillips." Mr. Phillips was instructed by the Government to draw up this report, because a paper which Mr. MacFarlan had communicated to the Pharmaceutical Society seemed to indicate that if methylated spirit were converted into sweet spirit of nitre, methyl alcohol was got rid of. Mr. MacFarlan did not really mean this, but such was the construction placed upon what he said.

¹ Read at a meeting of the Edinburgh Chemists' Assistants and Apprentices' Association, January 25.

² "Pharm. Journ.," xvii, 412.

When Mr. Phillips reported, Mr. MacFarlan heard of the report and wrote for a copy of it, which was granted. But he found that he would better understand the report if he had the specimens which Mr. Phillips had submitted; he ventured to ask them on loan and a munificent Government made him a present of them. Mr. MacFarlan submitted the specimens to the meeting and now, after the lapse of twenty-seven years, I have the good fortune to reproduce them. You will agree with me that this case¹ of specimens is of peculiar interest, for it forms a link with the past of the North British Branch and recalls Jacob Bell's memorable visits to Scotland.

Some time ago I ventured to examine a few of the specimens in order to ascertain the changes which had occurred since they were made, and I now give the results obtained. I may first, however, give you Mr. Phillips' account of the specimens.

"*Sample B.*—Sweet spirit of nitre prepared by the direct action of hyponitrous acid upon pure spirit of wine" [and distilled]. "Sp. gr. 879·05."

"*Sample C.*—Sweet spirit of nitre made from pure spirit of wine by the process of the London Pharmacopœia. Sp. gr. 858·35." (This is the portion of the distillate collected *after the nitric acid began to act*. So that it originally was much stronger than *spiritus ætheris nitrici*, P. L.)

"*Sample D.*—Obtained by passing hyponitrous acid through wood spirit [and distilling]. Sp. gr. 872·10."

"*Sample H.*—Sweet spirit of nitre prepared from methylated spirit by the process of the London Pharmacopœia. Sp. gr. 852·49."

"*Sample L.*—The same, but consists of the portion of the distillate collected after nitric acid began to act. Sp. gr. 874·85."

"*Sample N.*—The distillate obtained previous to sample L was mixed with its bulk of water and distilled. This is the second portion of distillate and is little else than a weak spirit. Sp. gr. 867·75."

¹ The case is made of solid mahogany, is 15 inches long, 8 inches high and 7 inches broad, and is divided diagonally from the top to the bottom, the upper portion forming a lid, and when secured by the hook catches, the whole case is easily portable. The lower portion is divided into twenty-one compartments for the two-ounce stoppered squats which contain the specimens. The case is not unlike a portable test reagent case.

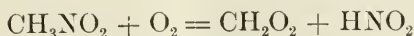
I first determined the specific gravities at 60° F.

Sample B.....	0.8956	Increase.....	0.01655
Sample C.....	0.8684	Increase.....	0.01005
Sample D.....	0.8828	Increase.....	0.01070
Sample H.....	0.8616	Increase.....	0.00911
Sample L.....	0.8844	Increase.....	0.00955
Sample N.....	0.8700	Increase.....	0.00225

These results are corroborative of a previous statement that increase in specific gravity is one of the results of deterioration.

The next point of interest is the odor and color of the samples. B and C are free from color and their odor is similar to that of sweet spirit of nitre. D is of a yellow color and strong amylic odor. H is slightly straw-colored and has a faint acetic ether odor. L is free from color, the odor is that of aldehyde. N is free from color and has a faint naphtha odor. The whole of these specimens failed to react with ferrous sulphate and sulphuric acid, potassium iodide and acetic acid, and did not affect the color of a weak solution of rosaniline hydrochlorate. The nitrous radicle was, therefore, entirely absent.

On the other hand, the samples B to L reacted, more or less strongly with the usual aldehyde reagents. They gave the phenol-sulphonic acid reaction, the aldehyde resin coloration with potash and reduced ammonio-silver nitrate. Unfortunately, the limited quantity of the samples, and their value as a curiosity, precluded accurate quantitative estimation; but I give a fair comparison judged from the degree of color produced in 15 minutes of each, by 2 drachms of potash solution. L contained twice as much as B and C, which were nearly similar, B giving greater reduction of silver. D and H gave very little color, but reduced the silver salt more than B and C, while L gave very intense reduction; this greater reduction of silver by D, H, L is due to the presence of formic acid derived from methyl nitrite thus:



It is interesting to know that after the lapse of twenty-seven years the specimens still contain aldehyde, and the fact is corroborative of my statement that the aldehyde of sweet spirit of nitre does not disappear as organic acid is produced, and a determination of the acidity of B, C and L brings out clearly the fact that a large aldehyde content may exist along with a large acid content.

Standardized soda solution (1 cc. = 0.0133 NaHO) used.

L. 5 cc. required 4.3 cc. for neutralization.

B. 5 cc. required 1.8 cc. for neutralization.

C. 5 cc. required 0.8 cc. for neutralization.

We thus see, in addition to facts already recorded, that in the course of time the nitrous constituent of sweet spirit of nitre entirely disappears; that aldehyde, one of the most readily oxidizable bodies remains; and that in sweet spirit of nitre made from methylated spirit, formic acid is one of the products of decomposition.—*Phar. Jour. and Trans.*, Feb. 21, 1885, p. 675.

THE PREPARATION AND CHARACTERS OF EXTRACT OF CALABAR BEAN.¹

BY ADAM GIBSON.

It having come under my notice that the physical characters of extract of Calabar bean varied considerably, I have been lead to undertake the preparation of the extract by the official process and several modifications thereof, and now have the pleasure of communicating my results.

The extract is one of the four pharmacopœial extracts which are prepared with rectified spirit. These extracts are of a resinous nature and are either partially or wholly insoluble in water. Upon this point, so far as the extract under notice is concerned, there seemed to be some dubiety; thus, in Squire's "Companion" we have the statement that half a grain of extract in ten minims of water is used for subcutaneous injection, thus inferring that the extract is soluble in water, while Mr. Martindale² states that if carefully prepared it is not miscible with water. This question of solubility was the one which really underlay the work upon which I now report, and although there seemed to be no doubt whatever that from its nature the extract should not be soluble in water, still the fact remained that some commercial samples are soluble, and it is my endeavor now to show why they are so.

For the preparation of the extract the British Pharmacopœia directs a

¹ Read at a Meeting of the North British Branch of the Pharmaceutical Society, January 14, 1885.

² "Extra Pharmacopœia," 2d edition, p. 209.

"pound of the beans in coarse powder to be macerated for forty-eight hours with a pint of rectified spirit, then percolated, four pints of spirit on the whole being used in the process; the percolate is evaporated in the usual manner to a soft extract. The yield of extract is exceedingly small, consequently the price is high, and possibly unremunerative. In the French Pharmacopœia (the only official statement on this point) it is stated that 1,000 grams of the beans yield 25 to 30 grams of extract of a pilular consistence; it must be borne in mind, however, that in this case the spirit used is 80 per cent., while that of the British Pharmacopœia is 84 per cent.

Having found in some preliminary experiments that the yield of extract increased as the alcoholic menstruum was diluted, I prepared several extracts with alcohol of four strengths, and obtained the following results:

Menstruum, Rectified Spirit.

Extract A.—Four ounces of the bean in coarse powder were macerated and percolated according to the official directions; the percolate measured 21 ounces.

Half an ounce of the percolate evaporated on the water-bath yielded 0.55 grain of extract, equivalent to 23.1 grains from the four ounces, or 1.32 per cent.

Menstruum, Alcohol, 66 per cent.

Extract B.—Four ounces of bean treated with this menstruum; the percolate measured 19 ounces.

Half an ounce of the percolate yielded 2.1 grains of extract, showing a total of 79.8 grains, or 4.56 per cent.

Menstruum, Alcohol, 58 per cent.

Extract C.—Four ounces of bean treated with this menstruum; the percolate measured 19 ounces.

Half an ounce of the percolate yielded 3.05 grains of extract; total yield 115.9 grains, or 6.62 per cent.

Menstruum, Proof Spirit.

Extract D.—Four ounces of bean treated with this menstruum; the percolate measured 19 ounces.

Half an ounce of the percolate yielded 4.35 grains of extract; total yield 165.3 grains, or 9.44 per cent.

We thus see that as the menstruum becomes more aqueous the greater is the yield of extract, and this is just what we would expect when we consider that water is the best solvent for the extractive matter. It would naturally be expected that the extracts so obtained, being widely different as to quantity, would present a corresponding difference of appearance. This is the case to some extent, but there is little distinction between extract *A* and extract *B*, I give, however, a short description of each.

Extract A.—A pale brown, homogeneous and viscid extract, with a somewhat fatty feeling when rubbed between the finger and thumb.

Extract B.—Similar, but when rubbed, a slight stickiness is felt.

Extract C.—A brown, homogeneous and stringy extract.

Extract D.—A dark brown extract, with black patches of resinous matter intermixed. The stringiness is more marked than in extract *C*.

It is scarcely possible to distinguish between *A* and *B*, but these are distinguished from *C* and *D* by the total absence of any stringy character. This characteristic may be useful as a rough indication of quality.

In their behavior towards water the extracts showed marked differences, and as the results make clear why some commercial samples are soluble, they are given here.

I. *Extract A.*—0.26 gram taken and triturated with cold distilled water (25 cc. used). The extract disintegrated in the mortar with difficulty; but after diligent use of the pestle it was thoroughly divided, forming a milky emulsion, which was then thrown on a wet filter. The solution filtered very slowly and was colorless. On evaporation the filtrate yielded 0.08 gram of extractive, equivalent to 30.76 per cent.

II. *Extract B.*—0.21 gram similarly treated, disintegrated more readily and gave a straw colored emulsion, which filtered a colored solution, and on evaporation yielded 0.12 gram, or 57.14 per cent. of extractive.

III. *Extract C.*—0.26 gram taken. This extract was readily miscible with the water and gave a colored and somewhat opaque solution. The extractive obtained was 0.21 gram, or 80.76 per cent.

IV. *Extract D.*—0.372 gram taken. This extract was also readily miscible with the water, and gave a pale brown but clear solution. The yield of extractive was 0.33 gram, or 88.7 per cent.

It is evident, therefore, that if we have an extract which is miscible with water, that extract has been improperly prepared.

Recognizing that the alkaloidal content of the extracts afforded the best indication of their value, I have determined the percentage of alkaloid in each case. For this purpose a weighed quantity of extract was treated with water acidulated with acetic acid and lead acetate added in excess to precipitate coloring and resinous matter. After filtration, the excess of lead was precipitated with sulphuretted hydrogen, and the liquid boiled and filtered, then evaporated to dryness and weighed—(call this “Extractive”). The residue was again dissolved in distilled water and rendered alkaline with ammonium carbonate. This was shaken with chloroform, the latter separated, filtered, and evaporated to dryness. The weight being that of alkaloid present, 0·5 gram of extract was used in each case, and the following results were obtained :

Extract A. Extractive.....	0·21	gram = 42	per cent.
“ Alkaloid.....	0·025	“ = 5	“
Extract B. Extractive.....	0·365	“ = 73	“
“ Alkaloid.....	0·013	“ = 2·6	“
Extract C. Extractive.....	0·40	“ = 80	“
“ Alkaloid	0·009	“ = 1·8	“
Extract D. Extractive	0·432	“ = 86·4	“
“ Alkaloid.....	0·006	“ = 1·2	“

In alkaloidal value the official extract is therefore the highest ; but when it comes to the question which is the best menstruum, it will be seen that rectified spirit is not the best. In fact, the official extract contains the most alkaloid, because it contains less extractive than the others. The following comparison shows the relative power of each menstruum :

Extract obtained from 4 ounces of the drug.

Rectified spirit 23·1 grains showing 5 per cent. alkaloid, content 1·155 grains.

Alcohol, 66 per cent., 79·8 grains showing 2·6 per cent. alkaloid, content 2·074 grains.

Alcohol, 58 per cent., 115·9 grains showing 1·8 per cent. alkaloid, content 2·086 grains.

Proof spirit 165·3 grains showing 1·2 per cent. alkaloid, content 1·983 grains.

If it were found that extract B, contained sufficient alkaloid for therapeutical purposes, the compilers of our Pharmacopœia might consider whether they should not allow it to take the place of the present extract; but apart from this, it is worthy of note that 66 per cent. alcohol is of all alcoholic menstrua the best suited for the full extraction of the alkaloid, while those of a lower percentage appear to be inadmissible on account of the large quantity of extractive matter dissolved by them.—*Pharm. Jour. and Trans.*, January 24, 1885, p. 593.

NOTE ON COMMERCIAL EXTRACT OF CALABAR BEAN.¹

BY PETER MAC EWEN.

Secretary in Scotland to the Pharmaceutical Society.

It is evident from Mr. Gibson's communication that a slight variation in the alcoholic strength of the menstruum used in the preparation of this extract may cause considerable difference in its character and alkaloidal strength, and some difference may also arise from variation in the quality of the drug. Indeed, we may surmise indefinitely regarding variation in the strength of this and other purely galenical preparations. We do not expect, under our present system, to find them uniform, but rather live in the hope of the replacement of them by "standard" preparations or by proximate principles when these answer therapeutical requirements and can be economically obtained.

Fortunately, in the case of Calabar bean, the antagonism between its two alkaloids, physostigmine (or eserine) and calabarine, has led to an extensive use of the former alkaloid in preference to the alcoholic extract, which has repeatedly proved to be untrustworthy, owing to the conflicting action and sometimes preponderance of calabarine, and also owing to variations in alkaloidal content. But the extract has not fallen into disuse, and although the pharmacist is seldom called upon to dispense it, the cases in which it is used are of so serious a nature that it is most important that it should be of good quality and that different samples should at least approach to uniformity. In order to ascertain how far this is the case with the extracts at present supplied to the pharmacist, I have obtained eight samples from well-known wholesale houses and dispensing establishments, and have sub-

¹ Read at a Meeting of the North British Branch of the Pharmaceutical Society, January 14, 1885.

jected them to the method of examination adopted by Mr. Gibson, to whom I beg to express my obligations for a perusal of the paper which has just been read.

The extracts differed considerably in consistence, but their color was the same, a brown-black and not the pale brown noted by Mr. Gibson. I presume that the darker color is an unavoidable consequence of manufacture on the large scale. Extract No. 1 was quite granular, minute black granules being imbedded in a brown fatty extract. This extract was further peculiar in the naphtha odor which it possessed, the residuum evidently of methylated spirit used in its manufacture. From Nos. 2, 3 and 5, a film of oil exuded on standing. This separation of oil is not inconsistent with careful manufacture, because the bean contains oil, which is extracted by the proper menstruum. No. 5 was semi-liquid when received. Nos. 6, 7 and 8 were easily miscible with water; the others were not. On subjecting the samples to Mr Gibson's method, I obtained the following results:

Extract No. 1.	Taken.....	0.525 gram, which yielded	
	Extractive	0.27	" = 51.42 per cent.
	Alkaloid	0.055	" = 10.47 "
" No. 2.	Taken.....	0.53	" which yielded
	Extractive	0.195	" = 36.79 per cent.
	Alkaloid	0.03	" = 5.66 "
" No. 3.	Taken.....	0.55	" which yielded
	Extractive	0.3	" = 54.54 per cent.
	Alkaloid	0.03	" = 5.45 "
" No. 4.	Taken.....	0.38	" which yielded
	Extractive	0.135	" = 35.52 per cent.
	Alkaloid	0.015	" = 3.94 "
" No. 5.	Taken.....	0.155	" which yielded
	Extractive	0.07	" = 45.15 per cent.
	Alkaloid	0.006	" = 3.87 "
" No. 6.	Taken	0.45	" which yielded
	Extractive	0.315	" = 70 per cent.
	Alkaloid	0.08	" = 6.6 "
" No. 7.	Taken.....	0.5	" which yielded
	Extractive	0.255	" = 52 per cent.
	Alkaloid	0.008	" = 1.6 "
" No. 8.	Taken.....	0.54	" which yielded
	Extractive	0.42	" = 77.7 per cent.
	Alkaloid	0.006	" = 1.1 "

The most noteworthy feature about these figures is the indication which they afford of the extensive variety at the disposal of the pharmacist.

When we approach the explanation of the differences we experience some difficulty, because we have no authorized statement of what extract of Calabar bean should and should not be. In the present case we may drop Nos. 7 and 8 out of the count as being hopelessly bad, because they do not nearly approach in alkaloidal content the average of the others. But by what standard are we to judge those which remain? Dr. Hager, who of all authorities consulted, gives most attention to the pharmacy of the bean, states (*Pharmaceutische Praxis*, Suppl., p. 948) that a dry extract generally contains from 9 to 11 per cent. of physostigmine, and that 2,750 grams of bean contain about 11 grams of the same alkaloid. But he previously states (*Praxis* vol. ii, p. 678) that the bean affords about 14 per cent of extract. Now a simple calculation will show that these figures are quite conflicting, and we are justified in setting them aside as valueless for our purpose. In the circumstances we may take Mr. Gibson's extract A, as our standard of comparison; so doing, and with his communication before us, further comment on the want of uniformity is unnecessary but I may be allowed a few comments on some special features of three of the extracts.

The alkaloid obtained from No. 2 was contaminated with rubeserin the oxidation product of physostigmine. Probably this may have arisen from slight overheating of the extract during manufacture.

The high alkaloidal content of Nos. 1 and 6 gives these extracts peculiar prominence, and points either to great difference in the strength of the bean or the use of another variety of greater strength. It is most unlikely that an occasional extract of true Calabar bean should show double the alkaloid that it usually does, but from a remark by Mr. Holmes on the seed of *Physostigma cylindrospermum*, it is more likely that extracts prepared from the cylindrical bean would show such a quantity. Mr. Holmes states (*Pharm. Journ.*, [3], ix, 913) that "on touching the cotyledons with liquor potassæ I was surprised to find that while the true beans gave a permanent pale yellow tint, the cylindrical ones gave a deep almost orange color ultimately turning to a greenish hue with the same reagent." Though not an absolute proof, this is undoubtedly a strong indication of greater alkaloidal strength possessed by the cylindrical beans, a strength which must necessarily be conveyed to the extract prepared from them. Now, although extract No. 1 has been prepared with methylated spirit, that as a menstruum possesses no greater solvent powers than rectified

spirit, so that the higher percentage of alkaloid cannot be due to this unwarranted and illegal modification of the official formula. You will observe in the case of No. 6 that the percentage of extractive is high, and if you compare this with Mr. Gibson's results you will find that *high extractive* indicates *low alkaloid*, but here we have both extractive and alkaloid high, and the natural inference is that the extract has been prepared from the cylindrical bean. If my surmise be correct, the use of this bean cannot be too strongly deprecated, because it is as dangerous to have preparations of too great potency as it is to have them worthless.

As the introduction of physostigmine and its salts into the new (British) Pharmacopœia has been proposed by its editors, I have no doubt that its official recognition will still further extend its use in preference to the alcoholic extract. But what shall be said of the latter, which is to remain? Should it be "standardized," or in what manner may we ensure uniformity? Granting that a certain percentage of physostigmine were fixed, that does not ensure the absence of an undue amount of calabarine, which has quite the opposite action of the other alkaloid.

There seems to be scope for further work in the direction of ascertaining whether calabarine and physostigmine are present in constant relative proportions or otherwise, and until knowledge on this point is gained, the extract cannot be said to be one which lends itself to standardizing.—*Pharm. Jour. and Trans.*, January 24, 1885, p. 594.

ALKALOIDS FROM THE BARK OF REMIJIA PURDIEANA.

BY O. HESSE.

A preliminary notice of some of the results contained in this paper has already appeared. A description is given of the structure and properties of the bark. The alkaloids of this bark have been previously examined by Arnaud, who found about 0.2 per cent. of cinchonamine, and 0.8 to 1.0 per cent. of cinchonine. The author confirms the presence of these bases, but finds that several other alkaloids are present, and that the amount of cinchonine is only 0.1 to 0.2 per cent. The separation of the alkaloids is effected as follows: the finely divided bark is extracted with hot alcohol, the solution evaporated, and the residue, after treatment with excess of caustic soda, extracted with ether. The ethereal solution is treated with excess of dilute

sulphuric acid, and shaken, when the sulphates of concusconine, chairamine, conchairamine, chairamidine and conchairamidine are precipitated, (A) whilst the sulphates of cinchonine and cinchonamine, with small quantities of the other bases, remain in solution (B). By addition of very dilute nitric acid to the solution (B) cinchonamine is precipitated as nitrate and cinchonine is left in solution. The precipitate A is digested with dilute soda, and the separated alkaloids, after washing, are dried in the air, dissolved in hot alcohol, and sulphuric acid diluted with alcohol, added in the proportion of 1 part H_2SO_4 to 8 parts of the alkaloids. Nearly the whole of the *concusconine* separates as sulphate, a further very small quantity separating on cooling. On adding concentrated hydrochloric acid to the cold alcoholic filtrate, *chairamine* separates as hydrochloride. The mother-liquor from this is heated, and small quantities of ammonium thiocyanate added as long as a crystalline precipitate is formed of *conchairamine* thiocyanate. After cooling and filtering, the liquid is again treated with ammonium thiocyanate, when a dark-colored pitch-like mass separates; the filtrate from this is treated with ammonia, and the resulting precipitate shaken up with benzene. The benzene solution is shaken with dilute acetic acid, and the solution of the acetates so obtained mixed with a saturated aqueous solution of ammonium sulphate, when a precipitate of chairamidine and conchairamidine sulphates is obtained. These are separated by dissolving them in boiling water and cooling, when the whole gelatinizes; on standing, crystals appear, the crystallization being complete after some days; on now heating to 40° , the *chairamidine* sulphate dissolves, whilst *conchairamidine* sulphate is left. The process must be repeated several times on the solution to obtain a pure product.

Cinchonamine and its salts have been to some extent described by Arnaud ("Am. Jour. Phar.," 1884, 156), whose results the author in general confirms, although differing in some details. *Cinchonamine*, $\text{C}_{19}\text{H}_{21}\text{N}_2\text{O}$, crystallizes in brilliant colorless needles, melts when anhydrous at 184 to 185° (194° Arnaud), is readily soluble in hot alcohol, ether, chloroform, carbon bisulphide, and benzene, sparingly soluble in light petroleum and water. Its alcoholic solution has a strong bitter taste, and an alkaline reaction, and is dextrorotary: $[\alpha]_D = +121.1^\circ$ at $p. = 2$ and $t. = 15^\circ$. It dissolves in concentrated sulphuric acid with reddish yellow color, which slowly darkens; in nitric acid with an intense yellow. It is soluble in concentrated hydrochloric acid, but it

is decomposed when heated with it in sealed tubes at 150° . It yields two series of salts, normal and monacid. The *hydrochloride*, $C_{19}H_{24}N_2O \cdot HCl$, crystallizes in anhydrous colorless plates, readily soluble in alcohol, very sparingly soluble in water (according to Arnaud it contains 1 mol. H_2O). The *platinochloride*, $(C_{19}H_{24}N_2O)_2 \cdot H_2PtCl_6$, is obtained as a yellow flocculent precipitate, apparently becoming crystalline after a time. The *hydrobromide*, $C_{19}H_{24}N_2O \cdot HBr$, crystallizes in long flat needles, sparingly soluble in cold water. The *hydriodide*, $C_{19}H_{24}N_2O \cdot HI$, forms long colorless flat needles. The *thiocyanate*, $C_{19}H_{24}N_2O \cdot CNSH$, forms colorless plates or short prisms, and is very sparingly soluble in cold water. The *nitrate*, $C_{19}H_{24}N_2O \cdot HNO_3$, forms short colorless prisms, melts at about 195° , is sparingly soluble in cold water, readily in boiling water and hot alcohol. The *normal sulphate*, $(C_{19}H_{24}N_2O)_2 \cdot H_2SO_4$, crystallizes in colorless prisms, is readily soluble in hot or cold water, very sparingly soluble in cold alcohol. Its aqueous solution is dextrorotary: $[\alpha]_D = +36.7^{\circ}$ at $p. = 2$ and $t. = 15$; $[\alpha]_D = +39.8^{\circ}$ at $p. = 6$; and $[\alpha]_D = +39.6^{\circ}$ at $p. = 2$ and 2 mol. H_2SO_4 . The *acid sulphate*, $C_{19}H_{24}N_2O \cdot H_2SO_4$, crystallizes in anhydrous prisms and shows the rotary power $[\alpha]_D = +34.9^{\circ}$ at $p. = 2.4$ and $t. = 15^{\circ}$ and $[\alpha]_D = +37.4^{\circ}$ at $p. = 6$. The *thio-sulphate*, $C_{19}H_{24}N_2O \cdot S_2O_3H_2$, forms anhydrous prisms sparingly soluble in water. *Acetylcinchonamine*, $C_{19}H_{23}AcN_2O$, prepared by heating cinchonamine with acetic anhydride for some hours at 85° , is amorphous, sinters together at 65° , and melts at 80 to 90° , is readily soluble in ether, alcohol, chloroform and acetic acid. *Dinitrocinchonamine*, $C_{19}H_{22}(NO_2)_2N_2O$, is best prepared by dissolving cinchonamine in nitric acid of sp. gr. 1.06, and pouring the intensely yellow solution into an excess of very dilute ammonia. It forms yellow flocks, melts at 118° , is readily soluble in ether, chloroform, alcohol and acetic acid. A solution in hydrochloric acid gives with platinic chloride a yellow flocculent precipitate of the *platinochloride*, $[C_{19}H_{22}(NO_2)_2N_2O]_2 \cdot H_2PtCl_6 + 3H_2O$.

Cinchonamine methiodide, $C_{19}H_{24}N_2O \cdot MeI + H_2O$, prepared by adding methyl iodide to a solution of cinchonamine in methyl alcohol, crystallizes in hard colorless prisms, readily soluble in alcohol, sparingly soluble in water. The *chloride*, $C_{19}H_{24}N_2O \cdot MeCl$, is amorphous. The *platinochloride*, $(C_{19}H_{24}N_2OMeCl)_2 \cdot PtCl_4$, is obtained as a yellow crystalline precipitate. The *hydroxide*, obtained by the action of silver oxide on an aqueous solution of the chloride, forms an amorphous

mass, readily soluble in water and alcohol, sparingly soluble in chloroform and ether. It has an intensely bitter taste, and is a powerful base, eagerly absorbing carbonic anhydride from the air.

Methyleinchonamine, $C_{19}H_{23}MeN_2O$, is prepared by boiling cinchonamine methiodide, chloride or hydroxide with caustic soda. It forms an amorphous white powder, melts at 139° , is readily soluble in alcohol, ether and chloroform, insoluble in water. The *chloride* is amorphous, the *platinochloride*, $(C_{19}H_{23}MeN_2O)_2, H_2PtCl_6 + 4H_2O$, is obtained as a reddish yellow flocculent precipitate.

Cinchonamine ethiodide, $C_{19}H_{24}N_2O, EtI$, forms a colorless varnish, readily soluble in alcohol, nearly insoluble in water. The *chloride* forms colorless prisms, readily soluble in alcohol and hot water. The *platinochloride*, $(C_{19}H_{24}N_2O, EtCl)_2, PtCl_4 + 2H_2O$, forms orange-colored crystals. The *sulphate*, $(C_{19}H_{24}N_2OEt)_2SO_4$, is colorless and amorphous. The *hydroxide* resembles the corresponding methyl compound.

Ethyleinchonamine, $(C_{19}H_{23}EtN_2O)_3 + H_2O$, forms a white powder, melts at 75 to 78° , or when anhydrous at 140° , and is readily soluble in ether and alcohol. The *platinochloride*, $(C_{19}H_{23}EtN_2O)_2, H_2PtCl_6 + 3H_2O$, forms a reddish yellow flocculent precipitate.

Concusconine, $C_{23}H_{26}N_2O_4 + H_2O$.—This alkaloid is obtained as the normal sulphate as already described, and is obtained in the free state by decomposition of the sulphate with dilute soda, and recrystallization from alcohol to which a little ammonia has been added. It forms colorless or pale yellow compact prisms. It is readily soluble in ether, chloroform, and benzene, sparingly soluble in boiling alcohol, insoluble in water. It is optically dextrorotary, giving for $C_{23}H_{26}N_2O_4 + H_2O$, $p. = 2$, $t. = 15^\circ$; in 97 vol per. cent. alcohol $[a]_D = 40.8^\circ$. The hydrate melts at 144° , becomes anhydrous, and then melts again at 206 to 208° ; at 140 to 150° it becomes dark brown colored, being in small part converted into amorphous concusconine. (This amorphous concusconine is readily separated by conversion of the fused mass into the normal sulphates, treatment with alcohol in which the sulphate of the amorphous base is readily soluble, and precipitation with ammonia, when it separates in dark brown, amorphous, readily fusible flocks.) Concusconine dissolves readily in acetic anhydride apparently without formation of an acetyl-derivative; from this it seems that no hydroxyl-groups are present. Nitric acid converts it into a dark green mass; addition of nitric acid to its solution in acetic or hydrochloric acids gives the dark green coloration characteristic of this group of alkaloids.

Concentrated sulphuric acid dissolves conusconine with bluish green color, becoming olive-green on heating. With chromic acid and sulphuric acid, it gives a coloration at first dark reddish brown, then intensely dark green. Although conusconine is tasteless, its solutions in acids have a bitter taste. The salts are as a rule gelatinous. The *platinochloride* $(C_{23}H_{26}N_2O_4)_2, H_2PtCl_6 + 5H_2O$, is obtained as a voluminous yellow flocculent precipitate. The normal *sulphate*, $(C_{23}H_{26}N_2O_4)_2, H_2SO_4$, forms small white prisms nearly insoluble in water and alcohol in the cold, sparingly soluble on heating. The *acid sulphate* is a gelatinous mass readily soluble in hot water. By mixing an alcoholic solution with methyl iodide, and allowing it to stand 24 hours, there is obtained a mixture of two *iodides* in about equal quantities; they can be separated by the difference of their solubilities in hot alcohol. The less soluble α -compound forms microscopic hexagonal prisms of the formula $C_{23}H_{26}N_2O_4, MeI$, very sparingly soluble in hot alcohol, moderately soluble in boiling water. By treatment with silver chloride it is converted into the *chloride*, $C_{23}H_{26}N_2O_4, MeCl$, crystallizing in microscopic needles, readily soluble in water and alcohol. The *platinochloride* $(C_{23}H_{26}MeN_2O_4Cl)_2, PtCl_4 + 4H_2O$, forms a yellowish red flocculent precipitate, and is insoluble in water. The *aurochloride* forms a dirty yellow flocculent precipitate, from which gold soon separates. The *sulphate* $(C_{23}H_{26}MeN_2O_4)_2SO_4$, formed by the action of silver sulphate on the iodide, is amorphous and very readily soluble in water and alcohol. Its rotary power in aqueous solution at $p. = 3.764$ and $t. = 15^\circ$ is $[\alpha]_D = +73^\circ$. The *hydroxide*, $C_{23}H_{26}N_2O_4Me.OH + 5H_2O$, obtained by the action of baryta-water on the sulphate, crystallizes in colorless cubes, melts at 202° , is readily soluble in alcohol and boiling water, insoluble in ether. The *iodide* of the β -compound, $C_{23}H_{26}N_2O_4MeI$, is gelatinous and dries in air to a horny mass; is somewhat soluble in boiling water, readily soluble in alcohol. The *chloride* is amorphous. The *platinochloride* $(C_{23}H_{26}N_2O_4MeCl)_2, PtCl_4 + 5H_2O$, is a reddish yellow flocculent precipitate. The *sulphate*, $(C_{23}H_{26}N_2O_4Me)_2SO_4$, is a brown amorphous mass, and has no action on polarized light. The *hydroxide*, $C_{23}H_{26}N_2O_4Me.OH + 2\frac{1}{2}H_2O$, forms a brown amorphous mass, readily soluble in cold water and alcohol.

Chairamine, $C_{22}H_{26}N_2O_4 + H_2O$, crystallizes in white needles or thick colorless prisms, and melts at 140° , or when anhydrous, at 233 . It is readily soluble in ether and chloroform, 1 part of the base dissolves in 540 parts of 97 per cent. alcohol. The alcoholic solution is

strongly dextrorotary ($[\alpha]_D = \text{about } 100^\circ$). Dissolved in sulphuric acid containing molybdic acid, the solution at first colorless becomes after a time an intense dark green. The *hydrochloride*, $C_{22}H_{26}N_2O_4, HCl + H_2O$, crystallizes in colorless needles, sparingly soluble in boiling water and alcohol, insoluble in dilute hydrochloric acid. The *platinochloride* $(C_{22}H_{26}N_2O_4)_2, H_2PtCl_6 + 2H_2O$, forms yellow needles insoluble in water and alcohol. The *normal sulphate* $(C_{22}H_{26}N_2O_4)_2, H_2SO_4 + 8H_2O$, forms concentric groups of colorless needles, sparingly soluble in cold water or alcohol. The *thiocyanate* forms white needles insoluble in water.

Conchairamine crystallizes with both water and alcohol of crystallization in thick colorless prisms of the formula $C_{22}H_{26}N_2O_4 + H_2O + C_2H_6O$, the compound showing three melting points, namely, 82 to 86° for the whole compound, 108 to 110° after expulsion of the alcohol, and about 120° for the anhydrous compound, the mass resolidifying between each temperature. A small portion is converted by the heating into amorphous conchairamine. Conchairamine is readily soluble in hot alcohol, in ether, and chloroform, sparingly soluble in cold alcohol. Its solution in 97 per cent. alcohol has a rotatory power $[\alpha]_D = +68.4^\circ$ at $p. = 2$ and $t. = 15^\circ$. The alcoholate dissolves in sulphuric acid containing molybdic acid, giving a brown coloration that soon becomes intensely dark green. With potassium chromate and sulphuric acid, it gives a coloration at first reddish brown, then dark green, and reddish yellow if boiled with excess. The *hydrochloride*, $C_{22}H_{26}N_2O_4, HCl + 2H_2O$, crystallizes in colorless plates, readily soluble in hot water and alcohol, sparingly soluble in cold water, nearly insoluble in ether. The *platinochloride*, $(C_{22}H_{26}N_2O_4)_2, H_2PtCl_6 + 5H_2O$, forms a dark yellow flocculent precipitate. The *hydriodide*, $C_{22}H_{26}N_2O_4, HI + H_2O$, crystallizes in colorless needles, sparingly soluble in cold water. The *thiocyanate* crystallizes in colorless needles, very sparingly soluble in hot water. The *sulphate* $(C_{22}H_{26}N_2O_4)_2, H_2SO_4 + 9H_2O$, crystallizes in long lustrous prisms, soluble in boiling water. The *nitrate* forms satiny plates or needles very sparingly soluble in water.

Conchairamine methiodide, $C_{22}H_{26}N_2O_4, MeI$, is obtained either in red crystals containing 1 mol. H_2O , or in colorless crystals with $3H_2O$. The *chloride*, $C_{22}H_{26}N_2O_4, MeCl + 2H_2O$, crystallizes in large colorless rhombohedrons, readily soluble in water and alcohol. The *pla-*

tinochloride has the complex formula $(C_{22}H_{26}N_2O_4MeCl)_2, PtCl_4 + (C_{22}H_{26}N_2O_4MeHCl)_2, PtCl_4 + 14H_2O$; it crystallizes in orange-colored needles, and is insoluble in cold water. The *nitrate* forms colorless satiny plates. The *hydroxide* formed by the action of moist silver oxide on the chloride, forms an amorphous brown mass of bitter taste, readily soluble in water, insoluble in ether.

Chairamidine, $C_{22}H_{26}N_2O_4 + H_2O$, forms an amorphous white powder, melts at 126 to 128°, and is readily soluble in ether, alcohol, benzene, and chloroform, insoluble in water. Its alcoholic solution shows the rotary power $[\alpha]_D = +7.8^\circ$ at $p. = 3$ and $t. = 15^\circ$. It dissolves in concentrated sulphuric acid with yellowish color, which later turns dark green. The *platinochloride* $(C_{22}H_{26}N_2O_4)_2, H_2PtCl_6 + 5H_2O$, forms yellow amorphous flocks insoluble in water. The *normal sulphate* and *hydrochloride* are gelatinous, the *acetate* forms a slimy mass.

Conchairamidine, $C_{22}H_{26}N_2O_4 + H_2O$, crystallizes in white needles, melts at 114 to 115°, and is very readily soluble in ether, chloroform, alcohol, benzene, and acetone. Its solution in alcohol (97 per cent.) is levorotary, $[\alpha]_D = -60^\circ$ at $p. = 3$ (anhydrous) and $t. = 15^\circ$. It dissolves in concentrated sulphuric acid with an intense dark green color. With chromic and sulphuric acid it gives a solution at first brown, then dark green. The *hydrochloride*, $C_{24}H_{26}N_2O_4, HCl + 3H_2O$, crystallizes in long colorless needles. The *platinochloride*, $(C_{22}H_{26}N_2O_4)_2, H_2PtCl_6 + 5H_2O$, forms a yellow flocculent precipitate. The *normal sulphate*, $(C_{22}H_{26}N_2O_4), H_2SO_4 + 14H_2O$, crystallizes in long colorless needles, sparingly soluble in cold water. The *thiocyanate* is amorphous, readily soluble in alcohol, and sparingly soluble in cold water. The substance described under the name of *concusconidine* in the author's earlier communication has been found to be a mixture of alkaloids.—*Jour. Chem. Soc.*, Jan., 1885, p. 64; from *Annalen* [225], 211-262.

Rhamnus Purshiana, De Candolle.—Limousin believes this bark, cascara sagrada, to contain ehrysophanic acid, and derivatives of this compound, which cause the red color, on the addition of potassa to the resinous principles obtained by Professor Prescott (see "Amer. Jour. Phar.," 1879, p. 166), and induce the change of the yellowish color of the powdered bark when kept in an atmosphere containing ammoniacal vapors.—*Jour. Phar. Chin.*, Jan., 1885, p. 80.

VARIETIES.

AMYL NITRITE AS AN ANIDOTE TO STRYCHNINE is recommended by Dr. H. O. Hare. It cannot be used by inhalation, but must be given in such quantities and at such times that its full physiological action be present constantly; it is useful only for tiding over the patient until more persistent antidotes can be administered.—*Bost. Med. and Surg. Jour.*, Nov. 20, 1884.

PICROTOXIN was used by Dr. Cauldwell for the relief of phthisical night sweats, and was found to be by far the best remedy. The dose recommended by Ringer and Murell, $\frac{1}{130}$ grain, being too small, he gave $\frac{1}{40}$ to $\frac{1}{20}$ grain in one dose at bedtime, to be repeated at midnight, if necessary. Success was invariable, and there were no disagreeable results.—*St. Louis Med. and Surg. Jour.*, Nov., 1884; *N. Y. Med. Jour.*

RHIGOLENE, a very volatile hydrocarbon of petroleum boiling at about 70° F, is noticed in several medical journals as a new local anæsthetic. It was introduced and recommended for this purpose by Dr. Henry J. Bigelow in a paper read before the Boston Society for Medical Improvement, April 9, 1866, and somewhat earlier, "kerosolene" was similarly employed by Prof. Simpson of Edinburgh. See *Amer. Jour. Phar.* 1866, p. 363.

USE OF OIL OF PEPPERMINT AND MENTHOL.—Dr. Brame states that oil of peppermint gives immediate relief of the pain in burns if applied after immersing the parts burned in water (*Lancet*). The itching of urticaria and mosquito bites is said to be much alleviated by the application of menthol.—*Cinc. Lanc. and Clinic.*

NEW ANÆSTHETIC COMPOUND.—An experimental and clinical study on a new method of producing anesthesia is the subject of a work, recently published, from the pen of M. Colombel. A combination of *atropine* (two centigrams), *morphine* (twenty centigrams), and *chloroform* (twenty grams), is the mixture recommended. Some of the surgeons at Lyons speak very favorably of its use.—*Lancet*, Oct. 25, 1884; *Quarterly Ther. Review*.

OIL OF THYME.—Camperdon (*Bull. gén. de thérapeut.*) arrives at the following deductions: 1. In therapeutical doses (three to fifteen grains), oil of thyme causes mental excitement or stimulation; hence it is a valuable diffusible stimulant in depression following anaemia, in conditions of collapses, etc. 2. It is an active diaphoretic and diuretic. 3. From its direct action upon mucous surfaces it is to be recommended in catarrhal affections of the respiratory and genito-urinary tracts. 4. It is a prompt hæmostatic. 5. Thyme possesses powerful antiseptic properties, and is well adapted for use in surgery. 6. It is recommended that the internal administration of the drug be supplemented by its employment in the form of baths, fumigations and inhalations.—*New York Medical Journal*.

MINUTES OF THE COLLEGE.

PHILADELPHIA, March 30, 1885.

The Annual Meeting of the Philadelphia College of Pharmacy was held this day at the College Hall, No. 145 North Tenth Street. Robert Shoemaker, Vice President, in the chair, and twenty-five members in attendance.

The minutes of the last stated meeting were read and adopted.

The minutes of the Board of Trustees for January, February and March were read by Mr. Wiegand and, on motion, approved.

The report of the Librarian for the year, being called for, was read by Mr. Wiegand and accepted.

PHILADELPHIA, March 30, 1885.

The Librarian respectfully reports that the volumes of the exchanges received for the Journals have been bound, and the theses for 1884 have been arranged for the binder with a few exceptions. He reports that the library has been much more used the last year than formerly, and that the new cases erected since last report have been filled, leaving more available space for new works, and the arrangement is more perfectly carried out.

The report of the Curator was then read. It was accompanied with a bound catalogue of all the specimens in the museum, arranged and marked in such a manner that any article in the cases can be found at once. The work performed evidenced much labor and perseverance, and reflects great credit on the Curator, Mr. Zeller. The thanks of the College were unanimously tendered to Mr. Zeller for the zeal and diligence displayed by him in the work.

PHILADELPHIA, March 30, 1885.

To the Officers and Members of the Philadelphia College of Pharmacy :

During the past year the Curator has prepared a catalogue of the specimens exhibited in the cabinet, which is herewith presented. The drugs have been arranged in alphabetical order and classified. The part of the plant represented by the drug determined the separation—roots, rhizomes, leaves, flowers, fruits, etc., each forming a separate class. In order to make the work more convenient for reference an index has been added. The pharmaceutical and chemical specimens have also been arranged according to the class to which each one belongs. A number of new and valuable specimens have been presented during the year at the pharmaceutical meetings. These meetings have for many years been the source of adding many specimens to the collection, and it is hoped that with the completion of the catalogue and index an additional stimulus will be given to the members and friends of the College to make the cabinet one of the most important features of the equipment. Trusting that the interest in this direction will be maintained with renewed vigor, the above report is respectfully submitted.

CHAS. FRED'K ZELLER, *Curator.*

Mr. Bullock read a report of the Publishing Committee as shown by the Business Editor, accompanied by the Treasurer's report of the Committee which was, on motion, accepted and directed to be placed on the minutes. This report shows a satisfactory condition of affairs in this department of the College.

The report of the Editor, giving a synopsis of the year's work, shows a little falling off on the part of members and others who have heretofore contributed to the pages of the Journal, and it is to be hoped that the request of the Editor in his report will be favorably considered by them.

To the Philadelphia College of Pharmacy :

The Editor respectfully reports that, during the year ending with the publication of the March number, 63 original papers were published in the "Journal," which shows a decrease of five as compared with the preceding year, but an increase of six over the year ending March, 1883. Of this number, 20 papers were abstracts of 34 theses, 27 were contributed by 19 non-members, and 16 papers by 9 members of the College. With the exception of one year, the present report shows the smallest number of papers contributed by the smallest number of College members during the past ten years, and only five of the papers were read at four pharmaceutical meetings. This statement does not include the editorials, reviews, reports, gleanings and varieties prepared by the Editor for the pages of the Journal. The Editor takes this opportunity of urging again upon the members and friends of the College to note their observations and communicate them to the pharmaceutical meetings for discussion and to the Journal for publication. Respectfully submitted,

JOHN M. MAISCH, *Editor.*

Professor Remington, on behalf of the Committee on Deceased Members, made the following report :

Ambrose Smith, whose death was announced at the last meeting of the College, was born in Philadelphia, Eighth month 8th, 1815. He received his early education in the Friends' School and was subsequently apprenticed, to learn the drug business, to his cousin Daniel B. Smith, one of the former Presidents of this College. After completing his apprenticeship, he graduated at the Philadelphia College of Pharmacy in 1834, and was admitted as a partner in the firm of Smith & Hodgson. He retired from the above firm and formed a partnership with Henry W. Worthington for the manufacture of prussiate of potash. He afterwards engaged in business at the northeast corner of Seventh and Chestnut streets, where he remained twenty years. He subsequently removed his business to the northeast corner of Broad and Chestnut, where he remained a few years, retiring altogether from business upon the death of his wife. Ambrose Smith became a member of the College, Ninth month 16th, 1839, and he was elected Treasurer in 1850, a position which he held for over twenty years. Faithful to all trusts confided to him, quiet and unassuming in his manner, he endeared himself to all of his friends by his strict integrity and sterling worth.

Resignations of A. D. Griffith and John T. Walker, as members of the College, were read and, on motion, accepted.

Mr. Procter presented the library of the College with a pamphlet, in four parts, entitled "What may be Learned from a Tree," by Harland Coultas, 1858, and Prof. Maisch, on behalf of Henry Cramer, a member of the College, also presented three old German works, bound in one volume, dated 1718 to 1728, and entitled "Medical-chemical handbook; the wise and jolly Medicus, by Hiatrophilo, and the sensible Medicus, by Forbigern." The books were, on motion, accepted with the thanks of the College.

The following gentlemen were appointed delegates to the Pennsylvania State Pharmaceutical Association, which meets at Erie, Pa., in June next, with power to fill all vacancies which may occur in the delegation, viz.: Messrs. Alonzo Robbins, Wallace Procter, Gustavus Pile, William B. Thompson, David W. Ross.

A letter from Dillwyn Parrish, President of the College, declining to be a candidate for re-election, was read and accepted, and ordered to be placed on the minutes. The Secretary was directed to convey the thanks of the College to him for the very satisfactory manner in which he has always

discharged the duties of the office, and to express to him the great regret the members all feel at the step he has felt called upon to take.

This being the annual meeting, the Chairman ordered an election of officers, trustees and the standing committees, and appointed Messrs. Henry Trimble and Edward C. Jones, tellers, who, upon taking a ballot, reported the following gentlemen elected :

President.—Charles Bullock.

1st Vice President.—Robert Shoemaker.

2d Vice President.—William J. Jenks.

Treasurer.—Samuel S. Bunting

Recording Secretary.—William B. Thompson.

Corresponding Secretary.—Alfred B. Taylor.

Board of Trustees (for three years).—William B. Webb, Wallace Procter, Gustavus Pile. Term ending March, 1888.

Trustee for the unexpired term of Wm. B. Thompson (elected Sec'y).—Daniel S. Jones.

Publication Committee.—John M. Maisch, Henry N. Rittenhouse, Thomas S. Wiegand, James T. Shiun, Charles Bullock.

Editor.—John M. Maisch.

Librarian.—Thomas S. Wiegand.

Curator.—Charles Frederick Zeller.

Mr. Bullock, in a few well-timed remarks, expressed his thanks for the honor conferred upon him by the members of the College, and the meeting, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—During the past session, two examinations were held for the purpose of determining the fitness of the junior students to proceed with their studies, in accordance with the plan which has been elaborately explained by Professor Remington in a paper published in our January number. In the following list we have placed together the questions in each department, the first two of the professors' questions being those of the November examination, and Nos. 3 and 4 those of the December examination. The final *junior examination* of the course was held on Saturday, February 14th. The number of students who availed themselves of the opportunity of extending their studies in the junior class over two years, by selecting the modified or partial examination, is somewhat greater than in previous years; but a still larger number might very properly and profitably have adopted the same course in view of the limited time left for study to those whose service in stores affords only sparse and irregular opportunities for systematic study.

BOTANY AND MATERIA MEDICA.

1. What compounds are necessary for the formation of cells? Explain the beginning, formation and growth of a cell.

2. What is the difference between a closed and an open fibrovascular bundle? Which of these fibrovascular bundles are found in the stem of a monocotyledonous, and of a dicotyledonous plant?

3. Give a description of the fertilization of the ovule of a phanerogamous plant.

4. Explain briefly the principles upon which the artificial system of classification by Linné is based.

5. Lobelia. Give the botanical name and habitat of the plant. Describe it (stem, branches, leaves, calyx, corolla, stamens, ovary and fruit). Give its medical properties and dose.

6. Give the botanical characters of the natural order of Urticaceæ. What difference is observed between American and Indian Cannabis? Give the medical properties and the dose of the Extract of Cannabis.

PHARMACY.

1. If the specific gravity of alcohol is 0.820 at 15.6°C. (60°F.), how much will the water weigh at the same temperature, which will exactly fill a bottle holding 205 grains of such alcohol?

2. Define the process of trituration, and write out a description of the mortars and pestles in use for all purposes of comminution, naming the substances that these implements are usually made of; the special uses of mortar and pestle made from each substance; the best shape for each kind; the reason for selecting the shape, and the prominent defects in the manufacture of many found in commerce.

3. Define the processes of evaporation, distillation and sublimation, and state how sublimes may be obtained in hard masses, in long crystals, in small particles.

4. Name the systems in which crystals are classed. Describe three methods of obtaining crystals, and give examples of chemical substances obtained by each method.

5. Describe four methods of preparing Syrups; give the advantages and disadvantages of each method with illustrations of four official Syrups, indicating in each case the reason for the preference given to the adopted method.

6. How is Liquor Potassæ prepared by the first process given in the U. S. Pharmacopœia? Explain the various steps in the process, and give the reason for selecting the Salt of Potassium which is directed. What is the chemical composition of the residue.

CHEMISTRY.

1—*a.* Describe the thermometer, and state its uses.

b. In what respects do the two thermometer scales recognized by the Pharmacopœia differ from each other?

c. Give the formulas for converting the readings of one scale into those of another.

2—*a.* What is magnetism?

b. Give the distinction between a native magnet, an artificial magnet and an electro magnet.

3—*a.* Write two reactions, using the symbols, for the preparation of Chlorine Gas.

b. Describe the experiments illustrating the affinity of Chlorine for Hydrogen.

4. Define an acid, a base and a salt, and give an example of each.

5. What is a Sulphate, a Sulphite, a Thio-sulphate? Give the chemical formulas of the free Acids in each case, and of two salts of each.

6. Enumerate the natural varieties of Carbon, and the artificial prepared varieties, stating with each of the latter how it is prepared.

The examination in Operative Pharmacy embraced percolation, solution, filtration and evaporation. The specimens for recognition were as follows:

Anthemis,
Mentha piperita,
Sambucus,

Aqua Carui,
Syrupus Zingiberis,
Extract. Ergotæ fluidum,

Sulphur præcipitatum,
Potassii bromidum,
Ferri sulphas,
Alcohol.

The re-examination of those students who failed in the February examination in one or more branches, will be held on Tuesday afternoon, September 29th, at 3 o'clock.

The examination of the Senior students was commenced on Thursday, February 26, and closed on Tuesday, March 3, with the practical branches of operative pharmacy and analytical chemistry. The following questions were asked :

MATERIA MEDICA AND BOTANY.

A. Rhatany Root. Give the botanical names, natural order and habitat of the plants yielding Rhatany. Describe the drug and point out the distinguishing characters of the official varieties. Give the constituents, the medical properties and the dose.

B. Define Aconite of the Pharmacopœia; name the plant, its natural order and habitat. Describe the physical characters and the structure of the drug. Give the approximate per centage of the alkaloids, and name the constituents. What are the medicinal properties and the dose of the drug?

C. Wild Cherry. Give the official name of the drug, and the botanical name, natural order and habitat of the plant. Describe the drug, give its constituents, the reaction and approximate percentage of poisonous principle resulting in the presence of water, and explain the difference of the drug collected in spring and in autumn. What are the medicinal properties and dose?

D. Uva ursi. Give the name, natural order and habitat of the plant; describe the drug, name the constituents and state which of these possess a bitter taste, and to which the diuretic and the astringent properties are due. Name some leaves containing the same principles.

E. Define Conium of the Pharmacopœia, and give the name, natural order and habitat of the plant. Describe the physical characters and structure of the drug; give the approximate percentage of alkaloids, and characterize these briefly as to their physical and poisonous properties. What is the dose of Conium and how is it distinguished from Anise?

F. Capsicum. Give the name, natural order and habitat of the plant, describe the drug and point out the difference in size and shape of the fruits of other species; give the acrid and other constituents, the medicinal properties and dose of the drug.

G. Stramonium Seed. Give the name, natural order and habitat of the plant, describe the drug and its internal structure, give its medicinal properties, dose and the approximate percentage of alkaloids, also a distinguishing test for the two alkaloids.

H. Define Kamala of the Pharmacopœia, and give the name, natural order and habitat of the plant. Describe the drug, including the structure of its different portions, name its solvents, constituents and the amount of ash yielded, and give its medicinal properties and dose.

I. Name the official Gummresins of the Umbelliferae; give for each the botanical name, and habitat of the plant, and briefly describe the drug. Give the approximate proportion of the chief constituents and state which of the volatile constituents contain sulphur, and which are free from it.

K. Spanish Flies. Give the name, order, habitat and mode of collection of the insect, and the approximate percentage of the vesicating principle, with a process for preparing it. In what respects do Chinese blistering flies differ from the official drug?

THEORY AND PRACTICE OF PHARMACY.

A. Name the official liquid, of which 25 grammes measures 20 cc. at 4°C. How many grains of mercury will a bottle hold which contains

exactly a pint of water at 60°F? Name, and give the specific gravity of the heaviest liquid for which the Pharmacopœia details a process for manufacture. Write out the process for this preparation.

B. Give the unabbreviated official names, ingredients, outlines of process, and describe the appearance of Black Draught, Simple Elixir, Lugol's Solution, Cold Cream, Spermaceti Cerate, Hoffman's Anodyne, Compound Spirit of Juniper, Compound Syrup of Sarsaparilla.

C. Give the English names, ingredients, outlines of process, and describe the appearance of Infusum Digitalis, Liquor Ferri Subsulphatis, Emplastrum Ammoniaci cum Hydrargyro, Syrupus Scille Compositus, Tinctura Cinchonæ Composita, Unguentum Gallæ, Spiritus Ætheris Nitrosi, Pulvis Antimonialis.

D. Give the official names, quantities and ingredients for one pound avoirdupois of Aromatic Powder, Cerate, and Tincture of Opium.

E. What is Pectose? Name several substances which contain it. What is the effect of the action of heat and acids upon it? What expedient is resorted to, in official processes, to overcome the effects produced by its presence in drugs?

F. Give the process, specific gravity, tests of purity and identity of the following: Stronger Ether, Alcohol, Carbolic Acid.

G. Give the tests for recognizing Veratrine, Polygalic Acid, Colchicine, Strychnine, Meconic Acid.

H. Of the following six liquids which are the best solvents for Tannin, namely: water, absolute alcohol, chloroform, glycerin, absolute ether, boiling water. Place the solvents in the order of their solvent power, beginning with the best.

I. How is Diluted Hydrocyanic Acid prepared? What is the standard of strength adopted by the U. S. Pharmacopœia? In what important respect does the present formula differ from that of the U. S. Pharmacopœia, 1870? In what official Syrup is this Acid found? Why is it present in this Syrup? Name the active substance produced when ground Black Mustard Seed is treated with water, and state how it is produced. Describe the process for an official preparation whose virtues depend upon the presence of this active substance.

K. Describe the theory of emulsification. Name a natural emulsion and describe its structure. Give three practical formulas illustrating three different methods of preparing emulsions. State the circumstances under which it would be best to use each method.

CHEMISTRY.

A. Define a neutral salt—an acid salt—a basic salt—a double salt. Give examples of each of these classes.

B. What is the chemical formula of *Alumen*? In what respect does the *Alumen* of the U. S. Pharmacopœia, 1880, differ from that of the *Alumen*, U. S. Pharmacopœia, 1870? How is *Alumen Exsiccatum* made? What are the properties of the metal contained in each of these compounds?

C. Give the chemical formula of *Argenti Nitras* and describe the official preparation. What is the composition of *Argenti Nitras Dilutus*—of *Argenti Nitras Fusus*?

D. What is "*Chili Saltpetre*?" What differences in properties do we find between this compound and common Saltpetre? Which is the more advantageous for use in the manufacture of Nitric Acid? Give reasons for this preference. State the important technical uses of each of these two compounds.

E. What is the composition of "*Salt of Tartar*?" By what process is it made and from what material? From what source do we obtain "*Cream of Tartar*?" Give its chemical formula and that of "*Tartar Emetic*."

F. Give the distinction between *ferrous* and *ferric* salts. Give examples of each class, using official compounds only. How can ferrous be con-

verted into ferric compounds? What officinal processes make use of such methods?

G. Give the formulas of *Acidum Oxalicum*, *Acidum Oleicum*, *Acidum Valerianicum*, *Acidum Tartaricum*, *Acidum Citricum*. Give the formula of a salt of each of these acids.

H. What is fermentation? Mention the several kinds of fermentation and state the products of each. Explain how starch-containing cereals are capable of fermenting. Mention some industries based upon fermentation processes.

I. What is the chemical difference between an essential oil and a fatty oil? What differences are there in their physical properties? From what natural sources are the two classes respectively obtained? What are the pharmaceutical and technical uses to which each class is applicable?

K. What is a Glucoside? By what reactions are they to be distinguished? Mention some officinal drugs of which the active principle is a Glucoside. Mention some Glucosides which yield officinal compounds as their decomposition products.

EXAMINING COMMITTEE.

A. Give the process for making *Yellow Oxide of Mercury*. State what precautions are necessary, and the reasons why. Give its officinal title. What officinal preparation does it enter into? How does it differ from the *Red Oxide of Mercury*? Give the process for the manufacture of *White Precipitate*. What precautions must be observed in making it? What is its chemical composition? Into what officinal preparation does it enter? Describe the process for the manufacture of *Citrine Ointment*, and explain the chemical changes which take place.

B. Give the *Officinal Name*, *Natural Order* and *Habitat* of five dicotyledonous plants which yield officinal rhizomes. Name the important constituents, and medicinal properties of each.

C. Give the formula of the compound which is formed when Ammonium Sulphide is added to a Salt of Aluminium. How is Aluminium separated from iron? How is iron separated from zinc? Give the color and formula of each of the precipitates produced by Sulphuretted Hydrogen on Salts of the following metals in acid solution: Mercury, Arsenic, Antimony. State how Calcium Salts may be detected in Sulphate of Magnesium.

D. Give the botanical name and natural order of the plant from which Almonds are obtained. Briefly describe the physical properties and structure of the seed. What are the chief constituents of Almonds? In what important constituent do the two varieties differ? Explain, in words or symbols, the chemical reaction which occurs when powdered bitter Almonds are macerated with water. What two officinal *products* are obtained from Almonds? Into what officinal preparations do these *products* enter? Into what officinal preparations do *Almonds* enter.

E. Name three officinal *Fluid Extracts* each made with a different menstruum. Give the proportions of the liquids composing the menstruum in each case. State why such variations are necessary. Why is maceration for a specific period directed in making Fluid Extracts? How much finished Fluid Extract is obtained from a kilogramme of drug?

F. Give the officinal name, natural order and habitat of the plant which yields Hops. Describe the physical properties and structure of Hops, and name an officinal preparation into which they enter. What other officinal substance does the plant yield, and from what part is it obtained? Give its physical and medicinal properties, and important constituents. What officinal preparation does it enter into?

G. Name the ingredients which enter into the composition of the following preparations; state briefly the mode of preparation and give the officinal title and dose of each: Dover's Powder, Spirit of Mindererus, Donovan's Solution, Brown Mixture, Compound Cathartic Pills.

H. Name the article of commerce from which Cream of Tartar is purified. State from what source this article is derived, and in what manner it is formed. What impurity is always found in it? Describe briefly a process of purification. What takes place when a boiling solution of Cream of Tartar is allowed to cool, and why? What are the chemical constituents of Cream of Tartar? What is its official title?

I. How should this prescription be compounded?

R Ammon. Carb..... ʒiiss
Syrup. Scillæ..... f ʒiiss
Pulv. Acacie..... ʒiii
Aque f ʒiiss
M. ft. mist.

Signa. Take a teaspoonful every four hours.

Critique the following prescription:

R Quininæ Sulph... gr. xxxii
Acid. Sulph. Aromat... gtt. lxiv
Aque..... f ʒii
Spt. Ammon. Aromat.. f ʒii
M. ft. mist.

Signa. Take a teaspoonful every four hours.

How should this ointment be prepared?

R Iodi..... ʒi
Extract. Opii..... gr x
Camphoræ..... gr. xv
Extract. Bellad. Ale..... ʒi
Adipis Benzoinat..... ʒi
ft. ung.

Signa. Apply as directed.

K. How would you prepare this prescription? What quantity of each active ingredient is contained

in a dose? Would you dispense it? Give your reasons why.

R Strychninæ Hydrochlorat. gr. i
Hydrag. Chlorid. Corrosiv. gr. ii
Liq. Acid. Arseniosi..... f ʒii
Tinct. Ferri Chlorid..... f ʒiv
Syrupi..... f ʒii
Elixir Aurant..... ad f ʒviii
ft. mist.

Signa. A tablespoonful three times a day.

How should this prescription be prepared? What reactions occur? What will the solution contain when finished? Is the dose a proper one?

R Argenti Cyanid..... gr. xxx
Acid. Hydrochloric.... gr. xxv
Aque Destillatæ..... gr. cclxxv
Misce.

Signa. Take sixty drops three times a day in a tablespoonful of water.

Write out the full name of each ingredient, and the direction for use.

R Hyd. Chlor.
Mur. Hyd¹..... aa ʒi
Acaciæ Pulv..... f ʒiv
Aq. Camph..... f ʒviii
Misce.

Signa. Injection. Use t. d.

The specimens selected for recognition were as follows:

MATERIA MEDICA.	PHARMACY.	CHEMISTRY.	COMMITTEE.
Taraxacum,	Pulv. Cretæ comp.,	Potassii bicarbonas,	Quassia,
Spigelia,	Pulv. Rhei comp.,	Potassii chloras,	Pimenta,
Quassia,	Infusum Digitalis,	Potassii permanganas,	Nux vomica,
Frangula,	Liquor Pepini,	Sodii bicarbonas,	Terebinthina,
Rhus Toxicod,	Vinum aromaticum,	Ammonii chloridum,	Cratum resinae,
Senna (Ale.),	Tinct. Saponis viridis,	Magnesi carbonas,	Tinctura Myrrhae,
Scoparius,	Tinct. Aloeset Myrrhae,	Zinci acetat,	Aqua Camphoræ,
Anisum,	Syrupus Rosae,	Plumbi acetat,	Potassii ferrocyanid
Physostigma,	Extract. Ergotæ fluidum,	Acidum aceticum,	Alumæu,
Lycopodium,	Unguent. Hydrargyri.	Benzinum,	Plumbi oxidum,

In Operative Pharmacy the candidates were required to prepare—

1. Granulated sodium salicylate.
2. Lozenges, each containing 5 grains of potassium chloride.
3. Emulsion of codliver oil, containing 50 per cent of the oil.
4. Unguentum hydrargyri nitratis.
5. Soap plaster, 4 x 6 inches.

In Analytical Chemistry the acids and bases had to be determined qualitatively in solutions containing three or four salts.

¹ The two articles are hydrate of chloral and muriate of hydrastine; the abbreviations were copied from prescriptions.—EDITOR.

The competitive examination of drugs with the microscope for the John M. Maisch prize by those candidates who had passed a "very satisfactory" examination in *Materia Medica*, including specimens, was conducted by John E. Cook, Ph.G., twelve candidates being entitled. The microscopic specimens selected were *Senega*, *Zingiber*, *Calamus*, *Cinchona* (*micrantha*), *Anisum*, *Carum*, *Linum*, *Hyoseyami semen*, *Lycopodium* and *Marantæ amylinum*. One of the candidates recognized all 10, one 9, one 6, and the remaining 5 or 4 of the specimens.

The following 147 students successfully passed in all branches, and were recommended to the Board of Trustees for the degree of Graduate in Pharmacy (Ph. G.):

George Sidney Amsden, Iowa, *Materia Medica for Students*.
Philip Anthes, Pennsylvania, *Lard and Adulterations*.
James Henry Barker, Louisiana, *Fluid Extracts*.
Max Bartel, Wisconsin, *Caryophyllus*.
Henry Bechberger, Ohio, *Our Own vs. Patent Preparations*.
William Bichy, New York, *Stillingia*.
Wayne Barker Bissell, New York, *Hop Extract*.
Luther Pascal Bowers, Maryland, *Ether Aceticus*.
Wm. Theodore Bozenhard, Ohio, *Hypophosphorous Acid*.
Henry Brandner, Jr., Kansas, *Assay of Cinchona*.
Albert Edward Brown, Alabama, *Analysis of Sulphate of Morphia*.
Robert Clark Cadmus, Pennsylvania, *Liquor Ferri Chloridi*.
Edward Daily Cahoon, Delaware, *Early Chemistry*.
George Lewis Carnan, New Jersey, *Concentrated Nitrous Ether*.
Carleton Cole Champion, Pennsylvania, *Future of Retail Pharmacists*.
Thomas Clements Colman, Pennsylvania, *Fraxinus Americana*.
James Sherman Cooley, New Jersey, *Pharmacy Laws*.
Charles John Craythorn, New Jersey, *Alcohol*.
Samuel Ross Crothers, Maryland, *Pharmacy*.
Fred. Horace Davis, Delaware, *Ailanthus glandulosus*.
Blythe James Davison, Pennsylvania, *Mentha Piperita*.
Oscar Boone Deakne, Delaware, *Citric Acid*.
David Ferguson Deem, Indiana, *Cod Liver Oil*.
William Edward DeLong, Pennsylvania, *Chemistry and Pharmacy*.
George Eicholtz Dennison, Pennsylvania, *Sanguinaria Canadensis*.
Ulysses Grant Dennison, Delaware, *Cod Liver Oil*.
William Milliken Denniston, Pennsylvania, *Arsenious Acid*.
William D. Deuschle, Ohio, *Elixirs*.
Morton Phelps Dickeson, Pennsylvania, *Emulsions*.
Henry Diefenbeck, Pennsylvania, *Hydrangea*.
Lewis Henry Dielman, Maryland, *Erythroxylon*.
Hermann Edward Frederick Dreiss, Texas, *Pepsin*.
Thomas Dunbar, Jr., Pennsylvania, *Liriodendron Tulipifera*.
George Henry Ebeling, West Virginia, *Hydrargyri Iodidum Viride*.
Jacob Addison Eberly, Pennsylvania, *Suppositories*.
George Washington Edmonds, Pennsylvania, *Pepsin and Peptones*.
Joseph Johnson Eldredge, New Jersey, *Pills and Excipients*.
Samuel S. Ely, Pennsylvania, *Crystallization*.
John George Engler, Connecticut, *Syrupus Pruni Virginianæ*.
Theodore Fearheller, Pennsylvania, *Emulsions*.
Edward Henry Fienhold, Pennsylvania, *The Pharmacist*.
Ralph Benton Gable, Pennsylvania, *Old and New Pharmacopœia Formulas*.
Adolf Emil Gebhard, Michigan, *Mounting of Botanical Specimens*.
Peter Spang Gehris, Pennsylvania, *Erythrina Piscidia*.

- Benjamin Wallace Green, Maryland, *Pharmaceutical Extracts*.
 George Adam Haffa, Pennsylvania, *Green Iodide of Mercury*.
 James Hervey Hagenbuch, Pennsylvania, *Chocolate*.
 Jesse Barclay Hall, Pennsylvania, *Medicinal Herbs of Montgomery Co.*
 William Swearingen Hamilton, West Virginia, *Gaultheria*.
 Arthur Browne Hammond, Maryland, *Liquor Magnesii Citratis*.
 Silas Marion Harrington, Texas, *Estimation of Alkaloids in Ignatia*.
 William Franklin Harper, Indiana, *Physostigma Venenosa*.
 Clinton Keltly Harris, New Jersey, *Simple Elixir*.
 Norton O. Harris, Delaware, *Oleum Morrhuor*.
 Daniel Herr Hassler, Pennsylvania, *Lime Fruit Juice*.
 Julius Dargan Haynsworth, South Carolina, *Oil of Turpentine and its Manufacture*.
 Henry George Heider, Wisconsin, *Syrupus Rhei*.
 Harry Ernest Heinitsh, Pennsylvania, *Tinctura Aconit Sativæ*.
 Edwin Hutter Hess, Pennsylvania, *Dover's Solution*.
 James Owen Howells, Ohio, *Ohio Wines and Derivatives*.
 James Hunter, Jr., Pennsylvania, *Carbo Animalis*.
 James Stanton Hunter, Pennsylvania, *Pulvis Ipecacuanhæ et Opii*.
 George Edward Hurd, Wisconsin, *Oleum Anthemidis Cotulæ*.
 Harry Ellsworth Jones, New Jersey, *Nitrate of Silver*.
 George Alexander Keller, Pennsylvania, *Oleic Acid and Oleates*.
 Stephen Rush Ketcham, Pennsylvania, *Emulsions*.
 Grant Elmer Kirk, Pennsylvania, *Eriodictyon Californicum*.
 Gustav Frank Kuehnelt, Wisconsin, *Rhododendron Maximum*.
 William Evans Kunkel, Pennsylvania, *Petroleum Ointments*.
 Elmer Bryan Kyle, Pennsylvania, *Menthol*.
 James Almer Kyner, Pennsylvania, *Butter*.
 Frank Theodore Landis, Pennsylvania, *Japanese Menthol*.
 Irvin Lincoln Lautenbacher, Pennsylvania, *Milk and Derivatives*.
 William John Laval, Indiana, *Menthol*.
 William M. Lewis, Pennsylvania, *Pills and their Excipients*.
 Llewellyn Hughes Lewis, Pennsylvania, *Erythroxylon Coca*.
 Frederick Jacob Lichtenberger, Illinois, *Thesis Writing*.
 Charles Napier Lochman, Pennsylvania, *Collinsonia Canadensis*.
 Henry Charles Christian Maisch, Pennsylvania, *Illicium Floridanum*.
 Joseph Mark Malatesta, Pennsylvania, *Opium*.
 Robert Borton Matter, Pennsylvania, *Hydrargyrum cum Creta*.
 Charles Milton Mauch, Jr., Pennsylvania, *Compound Tincture of Cinchona*.
 Rollin R. May, Delaware, *Amyl Nitrite*.
 Charles Eugene Mayer, Pennsylvania, *A Pharmacy*.
 Paul Ernest Meissner, Wisconsin, *An Indispensable*.
 Robert Stockton Johnson Mitcheson, Pennsylvania, *Olæa Volatilia*.
 Frank Morse, Indiana, *Advantages of Pharmaceutical Manufacturing*.
 Matt. U. S. Grant Moses, New Jersey, *Formation of Honey*.
 Elmer Marshall Mount, Delaware, *Pepsin*.
 Edward Oliver Moyer, Pennsylvania, *Oleates*.
 Edgar Harman Naudain, Delaware, *Pinckneya Pubens*.
 Jacob Lewis Nebinger, Pennsylvania, *Some Official Syrups*.
 John W. Newton, Ohio, *Coloring Matter of Hydrastis Canadensis*.
 Harry Louis Odenwelder, Pennsylvania, *Chloral Hydrate*.
 George Widdifield Pancoast, New Jersey, *Solubility of Quinine Pills*.
 Albert Raymond Patterson, Ohio, *Pharmacy*.
 Leopold Peters, Illinois, *Vinum Ipecacuanhæ*.
 Charles Clifton Ramey, Pennsylvania, *Gossypium Herbaceum*.
 Dennis Reagan, Pennsylvania, *Mentha Piperita*.
 Charles Morris Rebner, Kansas, *Scammony*.
 Charles Frederick Rebsamen, Kansas, *Practical Remarks*.
 Henry Otto Reinholdt, Wisconsin, *Magnesii Sulphas*.
 Walter Reynolds, Pennsylvania, *Oleum Gossypii Seminis*.
 William Stevens Rhoads, Pennsylvania, *Oleum Menthæ Piperitæ*.

Elias Ellsworth Riggs, New Jersey, *Emulsions*.
Joseph Cuttall Roberts, Delaware, *Fraxinus Americana*.
Benjamin Rosenzweig, Pennsylvania, *Extr. Rhei Fluidum*.
George Frederick Rössler, Germany, *Practical Hints*.
Andrew Curtin Santee, Pennsylvania, *Rubus*.
Henry Scholey Saunders, Canada, *Cross Sections*.
Emil Schaible, Indiana, *Carbonate of Ammonia*.
Carl Edward Schlegel, Iowa, *Illicium*.
Allen Curtis Schofield, Ohio, *Hamamelis*.
Herman Julius Schuchard, Texas, *Gum Mezquite*.
Frederick Schwartz, Pennsylvania, *Grains of Paradise*.
Wm. Frederick Seiler, Pennsylvania, *Ammonia*.
Abraham Lincoln Serfass, Pennsylvania, *Pills and Excipients*.
Henry Clay Shaw, West Virginia, *Orange Trees*.
Frederick Paul Sher, Pennsylvania, *Simaruba*.
Hans Heinrich Sinne, Germany, *Salicylic Acid*.
Christopher Columbus Smith, Pennsylvania, *Bismuth and Preparations*.
George Mark Smith, Pennsylvania, *Assay of Opium*.
Harry Barr Snively, Pennsylvania, *Thymus Vulgaris*.
Samuel Davis Swann, Florida, *Erythroxylon Coca*.
Harry Swain, Delaware, *Pulverization of Drugs*.
George Augustus Steinicken, Delaware, *Petroleum*.
John Henry Stermer, Pennsylvania, *Hydrocyanic Acid*.
Henry Deischer Stichter, Pennsylvania, *Opiates*.
Henry Lippincott Stiles, New Jersey, *Abstracts*.
Samuel Franklin Stoll, Ohio, *Excipient for Pills*.
Hugh McCallum Thiebaud, Indiana, *Erigeron*.
William Cochran Thompson, Pennsylvania, *Ustilago*.
Frederick Alden Tift, New Jersey, *Cellulose*.
Thomas Crowell Trefry, Nova Scotia, *Oils of Rose and Wintergreen*.
Samuel Levick Van Buskirk, Pennsylvania, *Maydis Stigmata*.
William Augustus Vannort, Maryland, *Acid Hydrocyanic Dilute*.
Frank Herman Von Achen, Illinois, *Assay of Quinine Pills*.
Samuel C. Webster, Pennsylvania, *Gossypium*.
Henry Wegener, Jr., Wisconsin, *Aspidosperma Quebracho*.
Benjamin Franklin Weisel, North Carolina, *Nitrate of Silver*.
Neri Bärndt Williams, Pennsylvania, *Nabalus Albus*.
Charles Bennett Whilden, South Carolina, *Iodoform*.
J. Frederick Windolph, Delaware, *Sprups by Cold Percolation*.
Robert Wellesley Woodill, Nova Scotia, *Alcohol*.
Alfred Conard Wood, Pennsylvania, *Chloride of Gold and Sodium*.
James Edward Wright, Pennsylvania, *Cane Sugar*.
William Oscar Yost, Pennsylvania, *Verbascum Thapsus*.

The final reunion of the Graduating class preceding the Commencement took place on Monday evening, March 23, in the Museum, at the professors' supper, when most of the officers of the College and of the members of the Board of Trustees were present, also several gentlemen from other Colleges of Pharmacy. The graduating class presented to the College two well-executed portraits of Prof. Trimble and of C. F. Zeller, Ph.G., assistant to the chair of pharmacy; and one of Rogers' groups of statuary was presented to Prof. Remington.

The commencement exercises were held at the Academy of Music, on the evening of March 24, when the degree of Graduate in Pharmacy was conferred upon the above successful candidates by Charles Bullock, first vice-president of the College. Mr. W. J. Jenks presented the Procter prize, a gold medal, to Henry C. C. Maisch and W. D. Deuschle, they having

attained the grade "very satisfactory" in each of the seven branches of examination.

The following students were awarded honorable mention, the general result of their examination having attained the grade "distinguished:" H. Bechberger, H. Brandner, Jr., W. D. Deuschle, J. O. Howells, G. E. Kirk, W. J. Laval, H. C. C. Maisch, R. B. Matter, P. E. Meissner, E. H. Naudain; and the following with the grade "meritorious:" Wm. Bichy, W. B. Bissell, O. B. Deakyne, J. G. Engler, S. M. Harrington, H. E. Heinitsh, C. N. Loehman, E. O. Moyer, J. W. Newton, E. Schaible, C. E. Schlegel and H. J. Schuchard. Mr. Wm. B. Thompson presented the Henry C. Lea prize, one hundred dollars, for the best Thesis to Henry C. C. Maisch, honorable mention being accorded to D. H. Hassler, C. E. Schlegel, G. E. Hurd and J. O. Howells. The Materia Medica prize, a Zentmayer histological microscope for the histological and chemical examination of an American drug, was presented by Prof. Maisch, to G. E. Hurd, with honorable mention of H. S. Saunders and G. E. Dennison. Prof. Sadtler presented the chemistry prize, a Troemner analytical balance, for analytical work, to H. C. C. Maisch, with honorable mention of W. Bichy, C. E. Schlegel, D. H. Hassler, J. O. Howells and A. E. Brown. The John M. Maisch prize, twenty dollars in gold, offered by Mr. J. H. Redsecker, of Lebanon, Pa., for the best microscopical examination of drugs, was presented by Prof. Maisch to J. G. Engler, with honorable mention of H. Bechberger, W. Bichy, W. B. Bissell, H. Brandner, Jr., O. B. Deakyne, W. D. Deuschle, W. J. Laval, H. C. C. Maisch, P. E. Meissner, E. O. Moyer and E. Schaible.

The valedictory address was delivered by Professor Sadtler, and the exercises terminated with the distribution to the graduates of many presents, including flowers, a commendable feature being that the latter were comparatively less numerous than in former years, while the useful presents and permanent souvenirs sent by the friends of the graduates, were evidently considered to be far more appropriate to such an occasion.

ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The twenty-first annual meeting was held in the Alumni room of the College building, on Friday afternoon, March 20, 1885, the President, Dr. C. A. Weidemann, in the chair. The President's annual address and the Secretary's report gave a condensed account of the work done during the past year. The twentieth anniversary of the organization of the Association had been commemorated by an excursion to Woodland Beach, the success of which led to the proposition of a similar celebration at each anniversary. The faithful services of the Treasurer, Edward C. Jones, during a period of many years, received well-deserved recognition. The average attendance at the five social meetings during the past winter was 115. The class in microscopy, under the efficient instruction of A. P. Brown, Ph.G., numbered 11 students; the importance of this work is evidently not recognized by the large majority of students, but it is to be hoped that a larger number will avail themselves of this opportunity during this spring and hereafter. The Alumni quiz classes were in successful

operation during the past session. Since the last annual meeting, 112 graduates became members of the Association, and 14 members died, the total membership being 1,016.

The following officers were elected to serve for the ensuing year: President, Howard B. French, class 1871; Vice Presidents, Wallace Procter, class 1872 and D. W. Ross, class 1877; Treasurer, E. C. Jones, class 1864; Recording Secretary, Wm. E. Krewson, class 1869; Corresponding Secretary, Clement B. Lowe, class 1884; Trustee of Sinking Fund Thomas S. Wiegand, class 1844.

The annual reception was held on the evening of the same day in the Pharmacy lecture room. The annual oration was delivered by Dr. F. E. Stewart, class 1876, the valedictory on behalf of the class by C. C. Ramey, and the class history by A. G. Hammond. The class prophet being unavoidably absent, the oration having, "The Future of the Class" for its theme was not given. The Alumni prizes were awarded as follows: gold medal to H. C. C. Maisch, of Philadelphia; and certificates in materia medica to W. J. Laval, of Evansville, Ind.; in pharmacy to J. F. Windolph, of Dover, Del.; in chemistry to J. O. Howells, of Bridgeport, O.; in general pharmacy to W. D. Deuschle, of Chillicothe, O; in operative pharmacy to H. Brandner, Jr., of Atchison, Kan.; in analytical chemistry to G. E. Kirk, of Philadelphia, and for the best collection of herbarium specimens of indigenous plants to F. P. Sher, of Philadelphia. The junior testimonial was awarded to W. B. Cheney, of South Manchester, Conn.

THE ZETA PHI ALPHA SOCIETY OF THE PHILADELPHIA COLLEGE OF PHARMACY held its triennial reunion, March 19th, at the museum of the College, about 140 ladies and gentlemen being present. Mr. Howard B. French presided and Mr. Thomas H. Potts officiated as toastmaster. At the meeting held in the afternoon, Mr. G. W. Kennedy was elected President for the ensuing term.

THE NEW YORK COLLEGE OF PHARMACY held its fifty-fifth annual commencement at Steinway Hall, March 17th, addresses being made by the President of the College, Ewen McIntyre, by Rev. R. C. Collyer and by B. E. Miot, Ph.G. The degree of Graduate in Pharmacy was conferred upon 71 candidates; in addition to these, three candidates had passed in pharmacy and five candidates in all branches except pharmacy.

THE LOUISVILLE COLLEGE OF PHARMACY, at its recent commencement, had 7 graduates. The following officers were elected for the ensuing year: President, E. Scheffer, Sr.; Vice Presidents, J. W. Fowler and W. Rogers; Recording Secretary, Fred. C. Miller; Corresponding Secretary, O. A. Beckmann; Treasurer, C. Tafel; Curator, O. E. Mueller.

THE ALUMNI ASSOCIATION OF THE LOUISVILLE COLLEGE OF PHARMACY elected the following officers: President, O. E. Mueller; Vice Presidents, B. Buckle, M.D. and P. Schlosser; Recording Secretary, O. C. Dilly; Cor-

responding Secretary, A. Schachner; Treasurer, P. Fischer; Executive Board, W. Tafel, E. Goebel, E. Scheffer, Jr., A. J. Schoettlin and S. Flexner. The Association contributed \$25 towards purchasing instruments for the use of the College.

THE PITTSBURG COLLEGE OF PHARMACY conferred the degree of Graduate in Pharmacy upon six candidates at the commencement, March 17th.

THE ST. LOUIS COLLEGE OF PHARMACY held its nineteenth commencement at Memorial Hall, March 18th.

THE ALBANY COLLEGE OF PHARMACY held its fourth commencement at Agricultural Hall, March 2d, eight candidates graduating.

EDITORIAL DEPARTMENT.

THE QUALIFICATIONS OF A GRADUATE IN PHARMACY, as far as they relate to practical experience in the drug business and to the age of the candidate, have been discussed in an open letter addressed "to the Conference of Teaching Colleges of Pharmacy" by the Board of Pharmacy of the State of Illinois, in which the following statement is made:

This Board has received applications of late for registration from persons claiming to be Graduates in Pharmacy, and who present as credentials to support their claims what are termed "Certificates of Graduation" or "Minor Certificates," issued by Colleges of Pharmacy holding membership in your organization; inquiry developing the fact that the holder at the time of final examination was lacking in age or experience and that these certificates were to be held until the age or experience is had, when a diploma will issue.

The Board is perfectly correct in refusing to recognize such certificates; in fact, Section 3 of the Pharmacy Law of Illinois, passed in 1881, compels the Board to take this course, because such certificates are not a "satisfactory diploma," nor are they "credentials of attainments," as explained in that Section. We have no knowledge of these certificates, except what is stated above, nor are we in favor of issuing such credentials; but it seems to us that they must indicate on their face the fact of *not* being diplomas. Are the holders of such certificates really graduates? or is not rather their becoming graduates depending upon some conditions still to be complied with? Does the fact of being announced as such at the annual commencement, really make the candidate a graduate, although he is fully aware that he cannot obtain the diploma, which is the evidence of graduation, until after he has complied with some additional requirements?

We believe that nearly all the Colleges of Pharmacy demand proof of a practical experience of $3\frac{1}{2}$ years before a candidate can be admitted to the final examination; the case cited by the Board, of an applicant who had only fifteen months' experience and still was in possession of such a certificate, must be regarded as exceptional and as not countenanced by the

Colleges. The letter states "that whatever experience or age is held to be necessary to make the applicant eligible to graduation, should be had prior to the final examination." In principle this is correct; yet the Illinois law permits graduates in medicine to become registered pharmacists without experience in the drug business and without examination; and licentiates in pharmacy may become registered pharmacists with a practical experience of two years and without qualification as to age. It seems to us, therefore, that the Board calls attention to the above mainly because of the apparent difference between the practice and the professed requirements of one or more Colleges, and consequently of the probable unreliability of documents issued by them. The letter concludes as follows:

The Illinois Board of Pharmacy, in the exercise of sound judgment, and having at heart the best interest of Pharmacy, will decline to grant registration to holders of such certificates without examination; and if, after a reasonable time, the practice of issuing such certificates is not abandoned, this Board will decline to accept as "satisfactory" the *diploma* of any College following the practice.

PREVENTION OF EPIDEMIC CHOLERA IN AMERICA.—The following report was adopted by the American Public Health Association and the Conference of State Boards of Health, at their meetings held in the city of St. Louis in October, 1884. We have purposely deferred its publication until the present time, when the approaching warm weather is likely to secure for it more careful attention than would be accorded to the recommendations during the winter months.

To the Conference of State Boards of Health:

MR. PRESIDENT AND MEMBERS: Your Committee, to whom was referred papers relating to the practical work required for the prevention of epidemic cholera in this country, respectfully report as follows:

Origin and Dissemination.—There are three essential factors to the prevalence of cholera in this country as an epidemic, (1) the importation of the disease by means of ships more or less directly from its only place of origin in India; (2) local unsanitary conditions favorable to the reception and development of the disease; (3) persons sick with the disease in some of its stages, or things infected by such sick persons, to carry it from place to place. These three factors naturally suggest the methods of combating the disease, for which there is needed practical work—international, national, and inter-state, State and local. So far as relates to State and local boards of health, their organization and activities are greater than ever before; but it must be admitted, that after cholera has been introduced into a country, inland quarantines are not easily and successfully maintained, although efforts in this direction are then advisable.

In view of the threatened introduction of cholera into this country during the coming year, and the consequent immense waste of life and property values through derangements of commerce, trade and productive industries, it is the sense of this conference that the general government should maintain such a national health service as shall, by rigid inspection at the port of embarkation, question the freedom from disease and infection of all persons and things from infected districts, and shall secure the surveillance of such persons and things while on shipboard, and when necessary, detention at quarantine stations on this side for treatment and disinfection.

Official Inspection.—In view of the present threatening aspect of Asiatic

cholera, and the constant danger from other communicable diseases occurring at foreign ports having commercial relations with the United States, we urge upon Congress to provide for the appointment and maintenance at all such foreign ports where cholera, yellow fever, plague, small pox, or scarlet fever exists, or are liable to exist, of medical officers of health, the same being either accredited consuls, or attached to the consulates. The duties of these officers shall be to give notice, by telegraph when practicable, of the existence or appearance of any of the above-named diseases to some constituted authority in this country; to give notice of the departure of any vessel known or suspected to be infected for any port in the United States; and, whenever requested by the master of any vessel about to load or leave for this country, to inspect thoroughly such vessel in all her parts, and also her cargo, her crew and passengers, to use such cleansing and disinfection as he may deem necessary, and to satisfy himself that all persons about to sail are free from dangerous communicable diseases, are not recently from infected places, and are properly protected from small-pox, giving to her commander a certificate of the inspection and of all precautionary measures taken. And it shall be the duty of the central authority in this country promptly to transmit intelligence of the existence of the above-mentioned diseases at foreign ports and places, and of the departure of dangerous vessels for the United States and Canada, to all State and local health authorities in the country which may be interested in the same.

We further recommend, in case of those foreign ports which have no consular agents of this country, or no telegraphic communication with this country, and which are liable to transmit pestilence through commercial intercourse, that one or more medical officers be chosen to visit such ports as often as may be deemed necessary by the central health authority in this country, so as to give trustworthy information of the health and sanitary condition of those places.

Canadian Health Alliance.—Inasmuch as the Dominion of Canada is equally interested with the United States in protecting itself and the United States from the importation of dangerous diseases, we suggest that Congress take such measures as will bring about concerted action with the Dominion and the British government, by which the consuls of this country or of England at foreign ports shall examine and take such action as they may deem effective, and notify the authorities of such government as has authority over any port to which any ship may sail in the United States or Canada, in order that such government may be in a position to take effective measures against the importation of these diseases.

We are gratified that the authorities of the Dominion of Canada and of the Province of Ontario have taken active steps toward protecting the people of Canada, and indirectly those of the United States, by the adoption of extensive quarantine regulations. We feel, however, that with respect to those regulations regarding the landing of passengers from the mail steamers along the St. Lawrence, etc., further special regulations for the thorough disinfection of the baggage and effects of all passengers, cabin or steerage, as come from infected ports or places, should be carried out in a manner similar to that recommended by the National Board of Health. Believing that the importation of cholera into this country has usually attended the presence of immigrants from infected countries, we therefore recommend that all such immigrants be prevented from landing at our ports until such time as the danger of the introduction of cholera by them shall have passed.

The inspection and quarantine service inaugurated by the National Board of Health, and set forth in the paper by Dr. Smart before this Conference, but which system is now inoperative for want of an appropriation by Congress, meets with our cordial approval. To enable these protective measures to be carried out, we recommend that Congress be urged in the strongest terms to legislate on this subject at an early date in its coming session, and to appropriate such funds as may be needful. The expenses incident

to the work which has to be performed at foreign ports, and the establishment of refuge stations at points on our own coast for the detention and treatment of infected vessels arriving from foreign ports, should undoubtedly be borne by the National Government, and not by individual States or municipalities; for the benefits accruing therefrom are general, and not restricted to localities, although some ports and cities on the coast may have a more immediate interest in the matter than others in the interior. It is probable, however, that this national protective work may not be sufficient.

Local Safeguards.—It will undoubtedly delay and lessen the chances of invasion, but it may not prevent invasion. The poison of the disease is subtle, and may effect an entrance into the country at some unguarded point. The funds necessary to the stamping out of the disease in a particular locality, and to the prevention of its spread to other localities, might in some instances be borne by the municipality or State affected; but should the disease occur in a locality which has failed or is unable to make provision for the occurrence, its spread to other cities and States would be imminent. The want of means at the infected point would be disastrous to many others. Congress has recognized the necessity for aid to State and local boards of health under similar conditions in the case of yellow fever. In 1879 the sum of \$500,000 was appropriated, and placed at the disposal of the National Board of Health; and the records show that of this sum \$160,000 was employed in combating the epidemic of that year. We therefore recommend that the influence of this Conference be used with the view of having appropriated by the National legislature the sum of \$500,000, to be used, or as much thereof as may be needful, in case of a cholera invasion, in stamping out the disease from the infected localities, and in preventing its spread from State to State.

The removal of local unsanitary conditions favorable to the development of cholera is the special work of State and local boards of health. Much has been done already in some States, but much remains which should receive immediate attention. Where it can be done, State sanitary inspectors should be appointed to visit all towns and cities specially liable to the disease, to counsel with the local authorities as to the best methods of prevention. This work should be vigorously prosecuted before the disease reaches our shores.

Advice to Citizens.—The cause of cholera is contained in the discharges from persons affected by the disease, or in things infected by such discharges. Should the disease reach our shores, the first case, and after this the first case which reaches any given community, should be strictly isolated. All infective material from these and from any subsequent cases should be destroyed in such manner as to stamp out the disease. Intelligent sanitary precautions beforehand, and scientific disinfection and treatment in the presence of the disease, should take the place of the necessary cruelties of a panic. In case any city or town is infected, the same principles of isolation should in general be applied to the city as to the infected individual. Intercourse with other cities and places should be under sanitary supervision, substantially as set forth in the rules and regulations of the National Board of Health respecting the inspection of travelers, disinfection of effects, vehicles, etc.

Health officers and inspectors appointed by State or provincial boards of health should, in addition to other sanitary work, see that the localities have set apart, erected, or planned to be so set apart or erected, structures which shall possess the sanitary requirements of an isolation hospital. But as regards all necessary work by local boards of health, most State and provincial boards of health have printed and issued documents which give ample instruction.

Your Committee recommend that when this Conference adjourns it be to meet in Washington, D. C., the second Wednesday in December, 1884, and that the Secretary of this conference be directed to invite the attendance at that time of the quarantine officers and the health officers of the principal cities in the United States and Canada; and that all delegates to that meet-

ing be prepared to report the sanitary status of their State or locality, and what steps have been taken to improve the same, and to prevent the introduction of disease.

All of which is respectfully submitted.

HENRY B. BAKER,
Secretary State Board of Health of Michigan.

H. P. WALCOTT,
Chairman Health Department of Massachusetts.

S. S. HERRICK,
Secretary State Board of Health of Louisiana.

PETER H. BRYCE,
Secretary Provincial Board of Health, Ontario, Canada.

JOHN H. RAUCH,
Secretary State Board of Health of Illinois.

Committee.

OBITUARY.

SAMUEL SIMES, a graduate of the Philadelphia College of Pharmacy, class 1833, died in this city, March 6th, of apoplexy. He was for many years in business at the corner of Twelfth and Chestnut streets, and identified himself with the Pennsylvania Salt Manufacturing Company, whose treasurer he was. He reached the ripe age of 71 years. His thesis on *Datura* was published in Vol. V of this Journal (1833); he originated *tinctura cinchonæ ferrata* in 1853, and in 1855 contributed to the Journal a paper on chocolate and iron lozenges.

EDWARD ZEITLER, PH.G., class 1858, died in Philadelphia, March 3d, of consumption. He was the son of the first manufacturer of matches in this city, and was for a long time established as a pharmacist in the north-eastern section of Philadelphia.

ROBERT W. DICKSON, PH.G., class 1862, died March 18th, of cirrhosis of the liver. He was for some time engaged in the drug business, and more recently he was in the employ of Powers & Weightman.

WILLIAM H. CRAWFORD died suddenly at St. Louis, March 17th, of fatty degeneration of the heart, about an hour after he had left his place of business, in apparently good health. He was born in Donegal, Ireland, and when quite young emigrated with his parents to the United States, the family living in Wheeling before they came to St. Louis, where the deceased entered the drug store of S. D. Hendall, and in 1861 started in business for himself. He took an active part in the organization of the St. Louis College of Pharmacy, his interest in the institution remaining unabated to the close of his life. In 1864 he became a member of the American Pharmaceutical Association, served as local secretary to the meeting held in 1871, and as one of the vice-presidents in 1878-1879, and for 24 years has faithfully acted as authorized agent of the Association.

Illicium Floridanum.—Ellis.

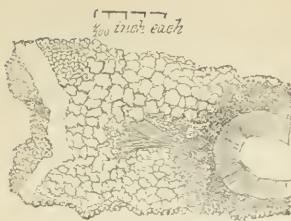


FIG. 11.—Capsule: transverse section through dorsal suture.

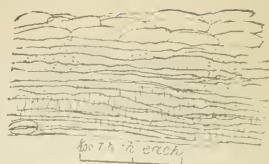


FIG. 15.—Capsule: longitudinal section.

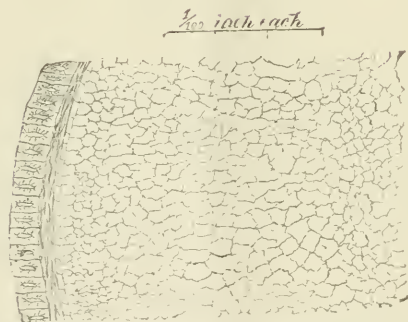


FIG. 17.—Seed: transverse section.

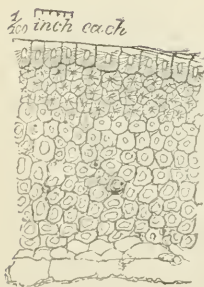


FIG. 16.—Capsule: transverse section near ventral suture.



FIG. 18.
Testa: exterior view.

Illicium Floridanum.—Ellis.



FIG. 7.—Stem : radial section.

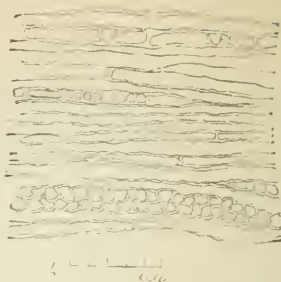


FIG. 8.—Stem : tangential section

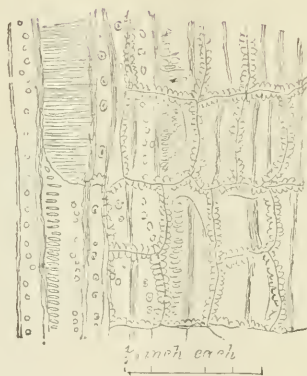


FIG. 9.—Stem : radial section.

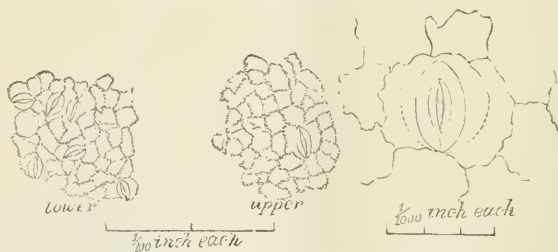


FIG. 10.—Epidermis of leaf.



FIG. 11.—Stoma.

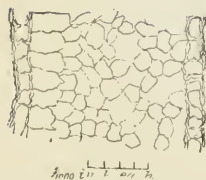


FIG. 12.—Leaf : transverse section, with stoma on lower surface.

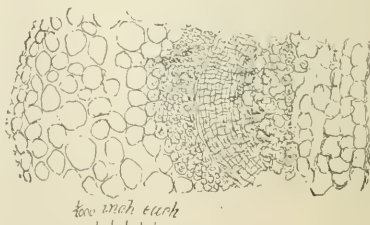


FIG. 13.—Leaf : transverse section, through midrib.

Illicium Floridanum.—Ellis.

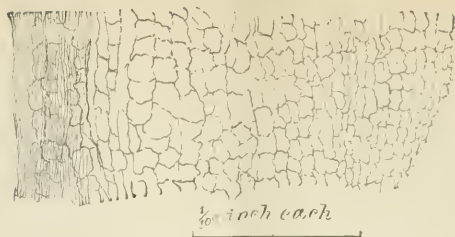


FIG. 4.—Stem-bark : longitudinal section.

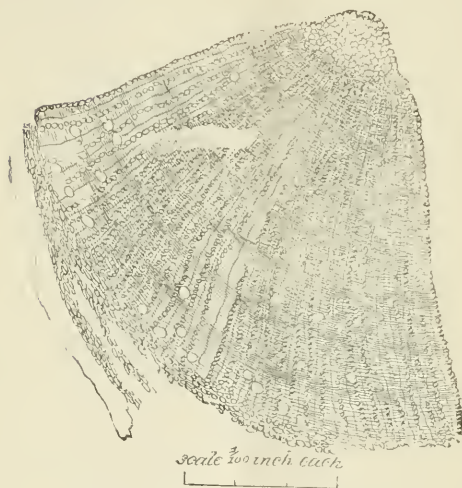


FIG. 5.—Stem : transverse section.

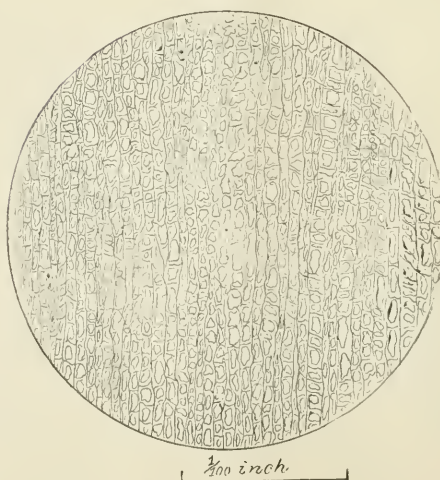


FIG. 6.—Stem : transverse section.

Illicium Floridanum.—Ellis.



FIG. 1.—Root: transverse section.

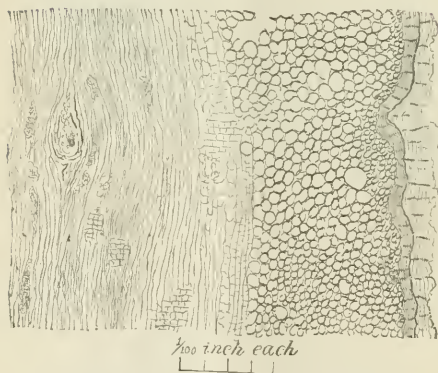


FIG. 2.—Root: longitudinal section.

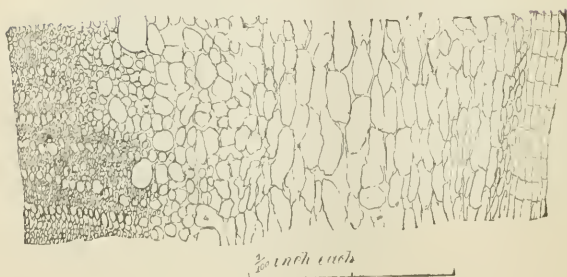


FIG. 3.—Stem-bark: transverse section.

THE AMERICAN JOURNAL OF PHARMACY.

MAY, 1885.

ILLICIAM FLORIDANUM, ELLIS.

Natural order, Magnoliaceae Illiciaceae.

BY HENRY C. C. MAISCH, PH.G.

From an Inaugural Essay.

This species is a shrub or small tree growing in swamps in Florida, Alabama and westward to Mississippi, and is popularly known as Southern star anise, Florida stink bush, or poison bay.

The leaves are about 4 inches long and $1\frac{1}{2}$ inch wide, short petiolate, acuminate, alternate, oblong-lanceolate, entire, smooth, indistinctly pellucid punctate. The midrib is very prominent on the lower side. Flowers are about one inch in diameter; sepals six, green gradually changing to color of petals, deciduous; petals purplish crimson or dark purple, linear, obtuse, in three whorls, the outer having often the color of the sepals; stamens 30 or more, about $\frac{1}{8}$ inch long and $\frac{1}{3}$ as wide; the anthers consist of two cells adnate, introrse, half the length of the stamen, dehiscence longitudinal; ovaries 13, separate; styles short, erect. In the flowers the carpels are erect, but after fructification they spread horizontally, forming a right angle with the axis. The carpels are capsular, dry, not woody, dehiscent at the ventral suture, and contain each one smooth shining seed about the size of an apple seed.

Griffith (*Med. Botany*, p. 101) said that the bark may be used as a substitute for cascarilla. The leaves are poisonous. The material for this investigation was kindly furnished by Hiland Flowers, Ph.G., of Amite City, La. (now of New Orleans).

HISTOLOGICAL INVESTIGATION.

Root.—The root, on cross-section, shows the bark and the wood to be of about the same thickness and also the entire absence of pith. The cork cells (Figs. 1 and 2) are flattened and tangentially elongated. The bark is composed of large and small thin-walled parenchymatous cells, the small ones being near the cambium and constituting the

inner bark, through which the medullary rays pass. The cells of the rays are larger than the surrounding bast parenchyma, and in the outer liber layer gradually increase in size to that of the cells in the primary or outer bark. The secondary bark contains no bast fibres and is made up of about 12 layers of cells. The primary bark is composed of about 24 layers, the cells increasing in size as they approach the middle. The cambium layer consists of about three rows of minute cells. The wood contains numerous medullary rays, one or two cells wide and from five to twenty cells high in an axial direction. It furthermore contains wood parenchyma, ducts and prosenchyma. The cells of the first are somewhat thickened, are axially elongated and found between the groups of medullary rays. The ducts are thinner-walled and larger than the prosenchyma, and have spiral and scalariform markings, while the prosenchyma cells are quadrangular and are marked by dots and disks.

Stem.—The bark is made up of two distinct layers (Figs. 3 and 4) besides the cork. The cork cells are flattened, closely packed, and elongated in a tangential direction. The primary bark is composed of large, thin-walled cells, which on cross-section are hexagonal and tangentially elongated. The inner layer of the primary bark has two or three interrupted circles of oil cells, the rest being smaller and hexagonal. The outer layer of the primary bark is composed of hexagonal, tangentially elongated and large cells. The secondary bark is composed of a layer of about twenty bast parenchyma cells and twelve cells of the medullary rays, these latter being larger and the secondary deposit relatively thinner than in the former cells, these being axially elongated. The cambium layer is about three cells in thickness. (Figs. 5 and 6.) The wood consists of medullary rays, wood parenchyma, ducts and prosenchyma. The medullary rays, on a cross-section, are seen to be made up of small radially elongated cells, the walls of which are materially thickened by secondary deposit, and which are placed in one or two radial rows, each row containing, in an axial direction, from three to seventeen cells. The wood parenchyma is only found between the perpendicular ends of the medullary rays, consequently in axial lines. (Figs. 7 and 8.) The cells are axially elongated, the cell walls are considerably thickened. The ducts have netted, spiral and scalariform markings (Fig. 9), while the lateral sides of the prosenchyma cells are marked with dots and disks. The pith is composed of hexagonal cells

on a cross-section. The cells are smallest near the wood, and gradually enlarge toward the centre.

Leaf.—The epidermis is composed of a single layer of flattened, thick-walled empty cells. The stomata are very numerous on the lower surface (Fig. 10), while only one was found in a space $\frac{3}{8}$ inch square of the upper surface. They are made up of four cells, two inner and two outer guard cells. (Fig. 11.) On a cross-section, the inner guard cells are seen to bulge into the opening at about half the height of the cells. The outer guard cells are slightly larger and overlap the inner cells at the edges. The rest of the epidermal cells have wavy cell walls. The portion of the leaf between the epidermal layers is made up of loose parenchyma with large air passages and a single palisade layer occupying (Fig. 12) about one-fourth the thickness of the leaf. The midrib is composed of wood fibres, which, on cross-section, appear quadrangular with their cell walls slightly thickened (Fig. 13). This prosenchymatous tissue is arranged in radiating lines and terminates above and below by curves. The concavity, which is toward the upper side of the leaf, is filled by the large-celled spiral ducts, and above this is a single row of bast fibres. On the lower side, the wood is surrounded by a cambium layer and outside of this there are two or three layers of bast fibres. Surrounding this bundle is the loose parenchyma tissue of the leaf, there being three layers of small cells above, and about six to eight layers below, the cells as they approach the epidermis becoming thick-walled. The upper and lower surface of the leaf at this point is covered by a rather thick cuticle.

Capsule—The capsules are composed mainly of parenchymatous tissue, there being only one unbranched fibrovascular bundle in each carpel running through the fleshy portion at the dorsal suture (Figs. 14 and 15). The receptacle for the seed is lined with closely packed elongated thick-walled cells having one end directed toward the seed. The cells near the ventral suture are in three layers (Fig. 16), the outer layer being composed of large parenchyma cells which are elongated in the direction of the style. The other two layers contain axially elongated cells with thickened cell walls, those of the middle layer having the smaller deposit. The outer layer is made up of about four rows of cells and the other two consist of about ten rows together.

Seed.—The seeds are albuminous. The albumen consists of hexagonal cells, seen in the section (Fig. 17), and contain oil. The endo-

pleura consists of one layer of cells, the walls of which are somewhat thickened. The testa consists of two layers, the inner is composed of about three rows of cells with thickened walls (Figs. 17 and 18), and the outer layer is made up of a single row of cells. The cell walls of the outer layer of the testa are very much thickened and extend in a radial direction. The exterior view of the testa shows the cell walls as wavy lines. The external layer of the testa is yellowish, while the interior one is brown.

COLLINSONIA CANADENSIS, LINNÉ.

Natural order, Labiate.

BY CHARLES NAPIER LOCHMAN, PH.G.

From an Inaugural Essay.

The thick, hard, knotty rhizome, from which the plant undoubtedly received the names *stone-root* and *knot-root*, grows horizontally but a few inches beneath the surface of the soil and attains a length of about six or eight inches. The plant seems to delight in stony soil, as it is always found in mountainous or very rocky and shady situations. At, and after the time of flowering, the leaves have an agreeable lemon-like odor, due to volatile oil contained in glands on the under-surface. About the time that the fruit is mature, especially if the plant is so situated as to be in the direct sunlight for part of the day, the calices have an odor similar to that of caraway; whether this is due to a volatile oil or a resin I have not been able to ascertain.

Description.—Flowers in racemes, arranged in a terminal panicle. The calices and pedicels covered with stalked glands. Calyx somewhat bilabiate, becoming four-sided and much enlarged in fruit; upper lip with three sharp-pointed teeth, lower with two lanceolate lobes; hairy in the throat. Corolla light yellow, generally purple-veined and hairy on the inside, elongated, widening from the throat outwards; four upper lobes small and obtuse; lower lobe much larger, ligulate and beautifully laciniate fringed. Fertile stamens two (with rudiments of a second pair), exserted, much exceeding the corolla. Style, purple, two cleft at the apex, about the length of the fertile stamens. Ovary deeply four parted, usually ripening only two of the four nutlets. Stem simple, erect, smooth, glaucous, obtusely four angled; from two to five feet high. Leaves thin, smooth, light green above (somewhat darker in the dried state), whitish underneath, ovate, coarsely

serrate, abrupt, or somewhat heart-shaped at the base, taper-pointed; the under surface dotted with small, depressed glands containing volatile oil.

The rhizome is from one to one and a half inches in thickness, four to eight inches long, irregularly branched, the upper surface marked with cup-shaped scars left by the stems of former years; on the lower surface it is covered with long, thin, brown rootlets; it has a thin, brown bark, and a very hard white wood more or less mottled with brown.

Analysis.—The drug was treated with menstrua in the order given in *Dragendorff's Plant Analysis*. One gram of the powdered rhizome and rootlets yielded .029 gram of ash, after being thoroughly ignited in a porcelain crucible. Fifty grams of the powdered rhizome and rootlets were macerated with 250 cc. of petroleum spirit for one week and the filtered liquid was allowed to evaporate spontaneously, when there was remaining 1.2 gram, or 2.4 per cent. of the weight of the drug employed. On heating this to 110°C. for some time, there was no loss in weight, showing the absence of an appreciable quantity of volatile oil. The residue was of a semi-solid waxy consistence, melting at 40°C., soluble in boiling alcohol, from which it was partly precipitated on cooling, and wholly on the addition of water. This appears to be vegetable wax.

After allowing the petroleum spirit to evaporate from the powder, it was treated with 250 cc. of stronger ether and this liquid allowed to evaporate at the ordinary temperature, when .3 gram of a somewhat bitter, yellowish, resinous substance was left. On treating this with slightly acidulated water a light yellow liquid was obtained, showing negative results with potassio-mercuric iodide and other tests for alkaloïds. Ferric chloride produced a greenish black precipitate which afterwards became inky. A precipitate was also formed on the addition of gelatin. The part remaining after treatment with acidulated water had all the characters of a resin and was almost completely soluble in 95 per cent. alcohol, partly soluble in a solution of potassa, and of a slight bitter taste.

After the ether had evaporated from the powder, it was macerated for eight days with alcohol, and the filtrate made up to 250 cc. Fifty cubic centimeters of this filtrate evaporated left .59 gram of extract, equal to 5.9 per cent. vegetable matter, neither soluble in petroleum spirit nor ether, but soluble in alcohol. On incinerating this extract

an almost unweighable ash remained, which proved to be principally carbonate of potassium. From the remaining filtrate the alcohol was distilled off and the residue carefully dried over sulphuric acid. The yield was a slightly bitter extract, in which tannin, which turned ferric salts greenish black and precipitated gelatin, was present, but no alkaloid could be found.

The powder remaining from the last operation was then macerated for twenty-four hours with 500 cc. of water, the infusion filtered off, and the dregs washed with sufficient water to bring it up to 500 cc. On evaporating a portion of this liquid it yielded an extract equal in weight to 10 per cent. of the original quantity of the drug employed; 20 cc. of this infusion was mixed with twice its volume of alcohol, when a precipitate was formed weighing .02 gram. This precipitate dissolved in water did not reduce Fehling's solution until it had been boiled with dilute hydrochloric acid. Its concentrated solution precipitated basic acetate of lead (vegetable mucilage).

A portion of the root on being boiled with water gave, on the addition of a solution of iodine, an intensely blue color (starch).

Leaves.—Ten grams of the powdered leaves were treated in the same manner as the rhizome, excepting a larger proportion of menstruum was used in each case. The petroleum spirit yielded .3 gram, or 3 per cent. of extract consisting of waxy matter soluble in boiling alcohol, a caoutchouc-like substance soluble in ether, and a trace of volatile oil. The ethereal tincture yielded .44 gram, equal to 4.4 per cent. of extract, which had little taste and odor, and on being triturated with sand and cold water gave a slightly yellowish brown solution, colored greenish black on the addition of ferric chloride. A few drops of acetic acid were then added to the liquid, which, together with the resin, was triturated for a few minutes, allowed to stand for two hours, and filtered. This liquid did not show any indication of an alkaloid upon the application of the various tests. The alcoholic tincture yielded .47 gram of a dark green extract containing tannin and chlorophyll, but no trace of an alkaloid.

About 16 lbs. of fresh leaves, collected when the plant was in full blossom, were distilled, yielding one drachm of a very light yellow volatile oil of a pleasant lemon-like odor.

From the foregoing meagre experiments the rhizome is shown to contain a resin soluble in ether and partly soluble in alcohol, vegetable wax, tannin, mucilage and starch; and the leaves resin, chlorophyll,

tannin, wax and volatile oil. The volatile oil is nearly all dissipated on drying, at least after several months. It seems almost impossible that this nearly tasteless rhizome should have the wonderful properties ascribed to it by certain eclectic physicians. If any part of the plant is of any use medicinally, I would judge it to be the fresh leaves.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

The "Sociedad Farmaceutica de Mexico," published a national pharmacopœia in 1874, and a second revised edition of this work appeared last year in the Spanish language under the title of "Nueva Farmacopea Mexicana de la Sociedad Farmaceutica de Mexico," the revision having been entrusted to a permanent commission consisting of Professors Alfonso Herrera, Francisco Gonzalez, Jose M. Laso de la Vega, Severiano Perez and Dr. Manuel S. Soriano.

It is a handsome octavo volume, the first 32 pages of which are occupied with a historical introduction and an explanation of the arrangement of the work. Then follow 16 pages of preliminary matter, containing various tables, the most important of which for our purpose are the tables of weights and measures. All pharmaceutical preparations being made by weight, a comparison of the medicinal weights will serve to show the great difference between the values attached to the same signs used in prescriptions in Mexico and in the United States.

Mexican weights.		United States weights.	
lb i = ̄ xvi	= gr. 9216 = gm. 460·24	lb i = ̄ xii	= gr. 5760 = gm. 373·24
̄ i = ̄ viii	= gr. 576 = gm. 28·76	̄ i = ̄ viii	= gr. 480 = gm. 31·10
̄ i = ̄ iii	= gr. 72 = gm. 3·60	̄ i = ̄ iii	= gr. 60 = gm. 3·89
̄ i	= gr. 24 = gm. 1·20	̄ i	= gr. 20 = gm. 1·30
gr. i	= gm. 0·05	gr. i	= gm. 0·065

The Mexican measure of capacity, the *cuartillo*, is nearly 4 per cent. smaller than the American pint, the former being 456·00 cc., the latter 473·18 cc. The *cuartillo*, like the American pint, is subdivided into 16 fluidounces (onzas medidas), the American fluidounce (29·57 cc.) being about 1 cc. larger than the Mexican onza medida (28·50 cc.); the latter is further subdivided into 8 fluidrachms, and these into 3 fluid scruples.

The second part treats, upon 94 pages, upon the crude drugs derived from the vegetable, animal and mineral kingdoms; and this is followed by the pharmacopœia proper (*Farmacopea propriamente dicha*), which is divided into two parts, the chemical products (112 pages) and the pharmaceutical preparations (96 pages), with 3 pages of supplement and appendix. The index alone covers 72 pages, and is divided into six separate parts, the Spanish, French, English, Mexican (and several other idioms) and Latin references, and an index of authors mentioned in the work. A lengthy list of typographical corrections, covering more than four pages, completes the book.

The text is printed in rather small but clear types, set closely, and is arranged in double columns in alphabetical order of the Spanish names of the subjects. The natural products (crude drugs) are treated of more or less extensively under the following sub-headings, following the names with the vernacular synonyms, botanical origin and natural order: habitat, part used or mode of preparation, physical characters, varieties, chemical composition, adulterations, common and special uses in medicine, therapeutics, the arts or for economic purposes, as well as incompatibles and antidotes. The chemical products and pharmaceutical preparations are treated of in a somewhat similar manner, the process of manufacture being given somewhat in detail.

It will be observed that the Mexican Pharmacopœia partakes in reality more of the character of a dispensatory than of a medical and pharmaceutical law-book. This becomes also evident from the very large number of drugs admitted, some of which are stated to be little used, like *brusco* (*Ruscus aculeatus*), *opopanax*, and others which have become obsolete in most civilized countries. While obviously the *materia medica* list enumerates a large number of drugs, which are well known here and elsewhere, it is of particular interest for the large number of vegetable products of Mexican origin which have been admitted, and to these we propose to pay special attention in the following brief review.

Abanico, *Celosia cristata*, *Lin.*, nat. ord. *Amarantaceæ*, the cockscomb cultivated in our gardens, grows in the Sierra de Huauchinango, and is popularly used in decoction of the leaves as an antiblennorrhagic.

Abelmosco, *Hibiscus Abelmoschus*, *Lin.*, nat. ord. *Malvaceæ*, furnishes the musk seeds of commerce, which are used as a perfume, and in the form of decoction as an emmenagogue and as an antidote to snake bites. The root is used medicinally as an emollient.

Abrojo de tierra caliente, *Tribulus terrestris*, *Lin.*, nat. ord. Zygophyllaceæ; indigenous to Yucatan. The root and seeds are commonly used for their tonic, stimulant and aperient properties, and a decoction of the leaves and stem, in the form of baths, against articular rheumatism. Taken internally the decoction of the leaves and root has a diuretic action.

Acedera, *Rumex Acetosa*, *Lin.*, nat. ord. Polygonaceæ, is somewhat employed as a diuretic.

Accite de Abeto is the turpentine obtained from *Pinus religiosa*, *Humb. et Bonpl.*, nat. ord. Coniferæ. The tree grows in the mountains surrounding the valley of Mexico and in other parts of the republic. The turpentine is viscous, nearly colorless, ultimately greenish yellow, has a lemon-like odor and a bitter, acrid and aromatic taste, dissolves incompletely in alcohol and mixed with one-tenth of calcined magnesia, acquires in about two days a pilular consistence. It contains volatile oil, extractive and resinoid matter, and abietic and succinic acids. It is procured by puncturing by means of a little tube the vesicles in which it is secreted in the bark. Ocote turpentine from *Pinus Teocote*, *Schlechtendal*, is frequently substituted for it, but differs materially in its physical properties.

Aeibar, aloes. Socotrine, hepatic (also called opaque socotrine), Cape and Barbadoes or Jamaica aloes are recognized. Socotrine aloes is stated to be superior to the other varieties, but Cape aloes is mostly employed in Mexico. Several species of aloe growing in Mexico might probably be used for obtaining this drug.

Acónito, *Aconitum Napellus*, *Lin.*, nat. ord. Ranunculaceæ. According to Oliva this plant grows in the sierra between Mazatlan and Durango; the variety *delphinoides* has been described by De Candolle as being peculiar to Central America. The leaves are the only part employed in Mexico.

Aexoyatie, *Ipomœa muricata*, *Kunth*, nat. ord. Convolvulaceæ, grows on the hills of Tacubaya and other places of the valley of Mexico. The root is rich in resin and is employed as a purgative.

Achicoria dulce, *Sonchus oleraceus* and *S. ciliatus*, *Lin.*, nat. ord. Composite; abundant near the City of Mexico. The root is commonly used as a tonic, and the leaves for their emollient and galactagogue properties.

Achiotillo, *Bixa Orellana*, *Lin.*, nat. ord. Bixaceæ, grows in hot localities. The leaves are popularly used as a purgative, and the seeds

as an antidote to *Manihot æsculifolia*, *Pohl*. From the seeds the dye stuff annato, *achiote*, is prepared, which is regarded as an antidysenteric. But the plant and its products are rarely used by physicians.

Adormideras, *Papaver somniferum*, *Lin.*, nat. ord. *Papaveracæ*; the capsules are used.

Agallas de Lavante, nutgalls. Under the name of *borregos de encina* the lanuginous galls of the evergreen Mexican oaks are popularly used as hæmostatics; they are produced by the sting of *Cynips Quercus baccarum*.

Agarico blanco, white agaric; used as a drastic and against profuse sweating of consumptives.

Agarico yesca, spunk; used surgically. *Boletus igniarius* is stated to be more commonly used in Mexico than *B. fomentarius*.

Agrimonia Eupatoria, *Lin.*, nat. ord. *Rosacæ*; our agrimony, grows also in Mexico. It is used as a mild astringent in the form of infusion or decoction in the proportion of 20 : 1000.

Aguate, *Persea gratissima*, *Gærtner*, nat. ord. *Lauracæ*, grows in the temperate and warm regions of Mexico, producing the varieties *vulgaris*, *oblongo*, *microphylla* and *Schiedeana*. The pulp of the fruit was found by Betancourt to contain various fats, chlorophyll, malic and acetic acids, various salts, glucose, gum and starch. The seeds contain yellow volatile oil, mannit, green bitter resin, starch, little tannin, fat, gum, etc. Betancourt found also amygdalin and synaptase, yielding hydrocyanic acid, and in the epicarp soft acid resin, aromatic principle, tannin, etc. The leaves and fruit have the reputation of being emmenagogue, and according to Hernandez, are believed by the vulgar to increase the spermatic secretion and to be useful in suppurating wounds and sores. A decoction of the leaves like the powdered bark is employed as an antiperiodic. The pericarp enjoys considerable reputation as a vermifuge in the dose of Gm. 8 to 10, taken fresh, or Gm. 4 to 6 in the dry state; this property probably resides in the resin. The mesocarp is edible and the juice of the seed is used as an indelible ink for clothes. The fruit is known in the West Indies as *alligator pear*.

Other species indigenous to Mexico are *Persea drymifolia*, *Schiede*, known as *aguacate olorosa*, *P. amplexicaulis*, *Sch.*, *P. pachipoda*, *Ehrenb.*, known as *aguacate cimarron*, *P. Ligue*, *Sch.*, and *P. butyracca*, *Sch.*, known as *pagua*.

Agamiel, the juice of different species and varieties of *Agave* is yellowish or whitish, mucilaginous, frothy, acidulous and sweet, of an

herbaceous odor and a density varying between 1.025 and 1.046. Rio de la Loza found in it sugar 9.55, gum and albumen 0.54, salts 0.73 per cent., the remainder being water, some resinous and albuminous matters, etc. Boussingault found 2.65 levulose, 6.17 sugar, 0.35 malic acid, etc. The juice is used for the manufacture of sugar and of a tolerably good vinegar; its reputed medicinal properties are antiscorbutic and antibleorrhagic.

LIQUOR IPECACUANHÆ ET MORPHINÆ.—DOVER'S SOLUTION.

BY EDWIN H. HESS, PH.G.

From an Inaugural Essay.

Preparation.—Take of acetate of morphine, one dram, diluted acetic acid, one fluidounce, diluted alcohol seven fluidounces, wine of ipecac, two fluidounces. Dissolve the acetate of morphine in the acid, add the diluted alcohol and wine of ipecac, and mix the whole thoroughly. Set aside for twenty-four hours, then filter through paper.

This preparation is not generally known, although used quite extensively where it has been introduced. It originated with Dr. J. D. Coleman of Juliustown, near Mount Holly, Burlington county, N. J., and afterward of Trenton, N. J., now deceased. The preparation is used in only a few other places, as far as I can ascertain, but judging from its popularity in those places, it certainly deserves a much wider scope for usefulness. In Trenton, where I became acquainted with it, it may be gotten from any pharmacist (and is always kept in stock), is prescribed by almost all the physicians, and has a local reputation among the people as a remedy for all ills common to mankind, probably as great as paregoric.

It is transparent, of a yellowish or amber color, due to the coloring matter of the ipecac and the wine. At first the odor is decidedly vinous, but at the same time acetous. It changes rapidly, however, becoming more agreeable, and then somewhat resembles the odor of whiskey, and doubtless contains some of the same or allied ethers. It has very little taste other than the persistent bitter of the morphine; three ounces by measure, should weigh exactly $2\frac{3}{4}$ ounces, troy, making its specific gravity .9654. Its color is very little affected by sunlight and refracted light. It has an acid reaction with test paper. It enters into the composition of a preparation known as

Red Drops, viz: Tinctura catechu composita, $\bar{3}v$; spiritus camphoræ, $\bar{3}i$; liquor Doveri, $\bar{3}ii$. This is quite an efficient remedy for diarrhœa, dysentery, cholera morbus, and all summer complaints in general. Locally, it has acquired no mean reputation among the physicians and others, and is thought by some to be equally as good, if not superior, to the renowned Asiatic cholera mixture, Squibb's compound solution of opium, and other preparations of wide-spread reputation.

In addition to the Dover's powder, a new preparation, known as tincture of ipecac and opium was made official in 1880. The solution of acetate of morphia (B. P.) is somewhat similar in its anodyne properties to the Dover's solution, and contains the acetate of morphine in acid solution of the strength of $\frac{1}{2}$ gr. to the drachm. Dover's syrup is a preparation manufactured in Philadelphia, containing syrup as a menstruum, which makes it quite palatable. Syrup, however, is apt to prove disadvantageous on account of its nauseating effects. Nearly all the preparations of this type have this effect, from the fact that they are compounds of opium and not morphine.

The medical properties accorded to the "solution" are, diuretic, diaphoretic, analgesic and sedative. It is quite efficient in the treatment of coughs, colds, etc., and in the first stages of acute inflammations attending throat and lung troubles. It is also very useful in the treatment of rheumatism, neuralgia, etc.

A fluidounce evaporated to pilular consistence, should not weigh more than $7\frac{1}{2}$ gr. (486 gms.) In attempting to scale the residue by the usual method I was not successful on account of its extreme deliquescence. The resulting mass, however, remains stable for several months, and may be conveniently rolled into pills. From several experiments I found it to be quite as effective in this form as in solution, and being quite heavy (dose $\frac{1}{2}$ grain), the pellets are very easy to take. The solution, on standing, without having been filtered, deposited a dark colored sediment, light in weight. On testing this for morphine none was found. A full grown cat was given different doses (of both liquid and solid form of the preparations), ranging from $\frac{1}{8}$ gr. to 2 gr., with the effect of producing sleep. Larger doses produced emesis with general exhaustion, but no alarming symptoms. From these experiments I concluded that it is almost a harmless preparation, as an overdose is almost certain to produce emesis.

GLEANINGS FROM FOREIGN JOURNALS.

BY J. ROBERT MOECHEL.

Eucalyptol, from *Eucalyptus globulus*, according to C. Jahns, has the formula, $C_{10}H_{18}O$, boils between $176-177^{\circ}C.$, has the spec. grav. $\cdot 923$ at $16^{\circ}C.$, is without optic action, and is identical with cajuputol, as it shows the same chemical and physical properties. He corroborates the observation of Faust and Homayer (1874), that the eucalyptol of Cloëz was a mixture, and shows that *Eucalyptolum purissimum* of commerce is merely rectified oil of eucalyptus.—*Arch. d. Pharm.*, January, 1885.

Determination of the Value of Pepsin.—O. Schlickum recommends for this purpose the conversion of albumen into peptone. An egg is placed in boiling water for five minutes, and rapidly cooled by cold water; the albumen will be hard, the yolk semi-liquid. Cut the albumen into very fine pieces, and rub through a fine sieve; of this albumen put 10 Gm. into a solution of 0.1 pepsin in 150 water, add 2.5 HCl and keep the mixture at a temperature of $40^{\circ}C.$ by means of a water bath. On being dissolved, the albumen is transformed first into hemialbumose, and afterward into peptone. Digest for 12 hours, then filter, and to 10 cc. of the filtrate add, drop by drop, 1 cc. HNO_3 , which should not cause more than a slight opalescence.—*Ph. Ztg.*, No. 16, 1885.

Quantitative Determination of Aloes.—According to H. Hager, aloes is soluble in a cold solution of carbonate of sodium, easily soluble in a 2 per cent. solution of ammonia, entirely so in 80 per cent. alcohol, incompletely in 90 per cent. and absolute alcohol, insoluble in a mixture of 1 vol. of absolute alcohol, 2 vol. of chloroform, and 3 vol. of benzol. To determine aloes in a liquid, evaporate, dry and powder; exhaust at a temperature of 18° to $25^{\circ}C.$ with the mixture of alcohol, chloroform and benzol, to separate all the resinous substances soluble in that mixture, and dry the residue; digest this with 80 per cent. alcohol at a temperature near $50^{\circ}C.$, frequently shaking; place the resulting solution in a weighed capsule, evaporate and dry. For each gram of the residue use 12 to 15 cc. of a 2 per cent. solution of ammonia, to dissolve the aloes; treat the resulting solution with a very slight excess of a solution of acetate of lead, and restore a slight ammoniacal smell by adding a few drops of ammonia water. Following these directions, the aloes is entirely precipitated as a lead compound. Col-

lect this precipitate, wash with a little distilled water and dry in a warm place. 1 Gm. aloes giving about 2.35 Gm. of the lead compound, multiply the weight of the latter by 0.4256; the result gives approximately the amount of aloes.

To determine the aloes, as such, mix the lead compound with an equal weight of sulphate of ammonium, moisten with water on a shallow plate, kept in a warm place; repeat moistening and drying, to get rid of the ammonia, and extract the dry mass with warm 80 per cent. alcohol; the residue yielded from the latter solution, increased by 12 per cent., gives the amount of aloes of the original mixture.—*Phar. Centralh.*, No. 12, 1885.

Mondamin is the meal of Indian corn deprived of oil.—*Ph. Centralh.*, No. 10, 1885.

Tasteless quinine tannate, containing a maximum quantity of the alkaloid. Mr. Peltz ("Ph. Ztg. f. Russland," 1885, p. 80) recommends the use of a solution (1:30) of hydrochlorate of quinine (in place of the sulphate), which is added to a solution of tannic acid previously neutralized with ammonia. After 24 hours the precipitate is collected, washed, and dried at a temperature not exceeding 30°C. The tannate thus obtained is a pale yellowish white amorphous powder, containing at least 20 per cent. of quinine, is soluble in 400 parts of cold water, in 50 parts of hot water, in 48 parts of cold alcohol, and in 3 parts of hot alcohol.

Vincetoxin.—Ch. Tanret, in an investigation of Vincetoxicum officinale, found two modifications of vincetoxin, a glucoside of the formula $C_{16}H_{12}O_6$, one soluble, the other insoluble, in water. The coarse powder, mixed with some slaked lime, is exhausted with water, the solution saturated with chloride of sodium, the precipitate washed with salted water, dried, shaken with chloroform, decolorized with charcoal, the liquid distilled, and the residue dissolved in an equal weight of alcohol. Now add ether, for precipitation, then half of the entire volume of water, and shake. Evaporate the watery solution, which yields the soluble modification. To the ethereal solution add water rendered slightly alkaline, which separates a resinous acid; shake with diluted H_2SO_4 , neutralize, distil, and dry the residue at 100°C., when the second modification is obtained.—*Rép. Pharm. Chimie*, No. 3, 1885.

The following formulas have been selected from a number contributed by Eug. Dieterich to "Phar. Centralhalle," 1885:

Acetum Carbolisatum (Carbolic Vinegar).—Mix 5 carbolic acid, 5 Cologne water and 90 diluted acetic acid. Keep in a cool place for several days and filter.

Acetum Fumale Excelsius (Fumigating Vinegar).—Mix 400 Gm. tincture of benzoin, 400 alcohol, 50 acetic ether, 50 essence of jessamine, 100 acetic acid, 10 drops of attar of rose, and 5 drops each of oil of neroli and oil of wintergreen. Keep in a cool place for several days; then filter.

Acetum Stomaticum.—200 compound tincture of spilanthes, 200 spirit of cochlearia (scurvy grass), 100 aromatic tincture, 50 acetic ether, 30 glacial acetic acid, 20 salicylic acid, 400 distilled water, 5 cochineal, 1 oil of sage, 1 oil of peppermint. Mix, warm in a water-bath to 60–70°C.; then keep in a cool place and filter. This vinegar is used as a mouth wash after meals, for which purpose a teaspoonful of it is diluted with about 8 ounces ($\frac{1}{4}$ liter) of water.

Acetum Camphoratum (Camphorated Vinegar).—Dissolve 1 camphor in 19 alcohol; mix with 80 dilute acetic acid. Keep in a cool place for several days and filter.

Acidum Aceticum Aromaticum Excelsius.—Mix 50 oil of bergamot, 50 oil of lemon, 9 oil of ylang-ylang, 1 oil of wintergreen and 89 glacial acetic acid. Keep in a cool place for several days; then filter. It may be colored with eosine or cochineal.

Acidum Aceticum Carbolisatum.—Mix 10 carbolic acid cryst., 85 acetic acid and 5 oil of eucalyptus. For fumigating the sick chamber, drop upon a hot plate.

Æther Cantharidini.—Dissolve 2 Gm. each of cantharidin and extract of cannabis in 996 ether. It is more effectual than cantharidal ether.

Æther Phosphoratus.—Melt 5 phosphorus in 5 glycerin; add gradually 10 pulverized charcoal; mix well, then add 1,000 ether. Shake for half an hour; repeat this four or five times during the day, and lastly filter, adding sufficient ether to make 1,000 parts of filtrate.

Bismuthum peptonatum, a new preparation introduced by E. Merk; it is a soluble powder, and is said to contain in 100 parts 3.1 of Bi, or 3.5 of oxide of bismuth.—*Ph. Centralhalle*, p. 134, 1885.

Koussinate of Sodium.—Pavesi recommends the following process: Mix the powdered koussou with lime, exhaust with alcohol and then with boiling water; mix, recover the alcohol, precipitate the koussin with an excess of concentrated acetic acid, wash, dry the precipitate, and decolorize by dissolving in boiling alcohol and treating with ani-

mal charcoal. Put a portion of the koussin in a capsule containing very hot water, and add crystallized carbonate of sodium until complete solution has been effected. Boil for a few minutes with animal charcoal, filter, and evaporate at a moderate heat. The sodium kousinate is an amorphous, pulverulent mass, of a yellowish white color, little hygroscopic, soluble in cold and more so in warm water and alcohol.—*Journ. de Pharm. d'Alsace-Lorraine*, No. 3, 1885.

Cocaine is recommended as an antidote to morphine.—*D. Med. Ztg.*, p. 25, 1885.

Ground pepper, according to Chr. Neuss, is readily examined for adulterations by pouring upon it concentrated HCl, which imparts a yellow color to all the pepper particles except the black shell. From a rather coarse powder the foreign particles may be readily separated and weighed.—*Ph. Ztg.*

Ground cloves, adulterated with the powdered bark of sassafras, has been observed by Bernbeck.—*Ph. Ztg.*

Paraffinum iodatum has been recommended in place of tincture of iodine. Paraffin oil dissolves iodine with a splendid deep violet color; the strength of the solution is stated by C. Jehn to be 5 per cent.; a 10 per cent. solution cannot be effected, except by dissolving the iodine in absolute ether and diluting with paraffin oil to the strength desired.—*Arch. Pharm; Chemiker Ztg.*, No. 16, 1885.

The "Phar. Centralhalle" states that 5 per cent. of iodine cannot be dissolved with the aid of slight heat in paraffin oil from different sources, and that the solution resulting at a higher temperature deposits iodine, leaving about $3\frac{1}{2}$ per cent. of it dissolved in the cold paraffin oil.

Bromine for bleaching sponges has been recommended. Dissolve bromine in 30 parts of water; place the sponges in this solution until they have acquired the desired color; then wash with water acidulated with HCl, and lastly with clean water.—*Journ. de Pharm. d'Anvers*, January, 1885.

Antidote to Iodoform.—M. Behring recommends a 5 or 10 per cent. solution of bicarbonate of sodium.—*Journ. de Pharmacologie; Journ. de Ph. d'Alsace-Lorraine*, No. 2, 1885.

Detection of Iodine after Taking Iodoform.—According to Dr. O. Schweissinger, the iodine cannot be completely separated as iodide of palladium, in consequence of the formation of organic combinations. The same observation has been made by Prof. E. Harnack.

Acidulate the urine with HCl, precipitate with palladious chloride; the following day collect the precipitate on a filter, wash, mix with soda and heat to redness; extract with hot water, filter, wash, acidulate the filtrate, and precipitate again with palladious chloride; collect the precipitate on a filter, wash, dry and weigh. The resulting palladious iodide contains the iodine present as iodide.

For determining all the iodine, measure a certain quantity of urine; add soda, evaporate to dryness, heat to redness, extract repeatedly with hot water, filter, acidulate, and precipitate with palladious chloride; weigh, and calculate the iodine. Harnaek found in this way 0.5277 iodine in 1 liter of which but 0.1072 was present as iodide, while nearly $\frac{4}{5}$ of the iodine was in combination, and could be estimated only after ignition.—*Ph. Ztg.*, No. 20, 1885.

Dental Mastich.—Dissolve 4 mastich and 2.5 balsam of Peru in 7 chloroform.—*L'Union Pharm.*, February, 1885.

A formula in "*Phar. Zeitg.*" recommends 2 mastich, 2 balsam of Peru, and 7 Gm. chloroform.

Vinum iodatum is a preparation highly praised by M. H. Barnouvin. Any wine of but small percentage of tannin may be employed. The proportions are 0.4 to 0.5 Gm. iodine, dissolved in a small quantity of alcohol, and wine *q. s.* to make 1 liter.—*L'Union Pharm.*, February, 1885.

Corn Cure.—Oleum phosphoratum is recommended as excellent to be applied every morning on the place of the stocking touching the corn.

To Distinguish Fresh from Old Ergot.—Koster recommends macerating for some time 2 Gm. of the powder with 5 cc. ether. The resulting solution will be colorless if the ergot is fresh, but yellowish if old.—*Arch. d. Pharm.*

Bernbeck, in "*Phar. Ztg.*," remarks that this solution should be neutral, and that the oil of old ergot is rancid, therefore giving a more or less acid reaction.

Aqua Picis.—In the place of pine wood saw dust, previously recommended (see "*Amer. Jour. Phar.*," 1877, p. 350) for dividing (pulverizing) the tar, A. Simon uses the residue of powdered cinchona bark left from the preparation of the tincture, etc. The resulting tar water is slightly bitter from traces of alkaloids, the solution of which is flavored by the acids of the tar. The tar powder thus obtained may

be put into packages, and does not stain the paper.—*Rép. Pharm. Chimie*, No. 3, 1885.

Test for Oil of Rose.—O. Helm, in “*Archiv Pharm.*,” 1885, p. 104, observes that the test with a mixture of 5 p. chloroform and 20 p. alcohol cannot be relied upon, as no separation of crystalline scales took place in four different rose oils which were doubtless genuine. But Prof. Flückiger (“*Archiv*,” p. 185) states that in an experience of many years it has never failed in his hands.

Russian Leather.—Skins tanned with willow bark, and dried, are rubbed with a woollen cloth moistened with birch tar; a solution of alum is applied, then a solution of potassium carbonate and Brazil wood to give the desired color, and lastly the leather is rubbed with fish oil.—*Phar. Ztg.*, No. 18, 1885.

To Prevent Label-moulding in Cellars, etc.—Dissolve borax in the water used to make the paste.—*Ph. Handelsblatt*, No. 5, 1885.

Porcelain-like Label.—Mix thoroughly 1 part of oxide of zinc and 10 parts of solution of silicate of sodium. Put on the bottle three or four coatings, and letter with coal tar diluted with some oil of turpentine.—*Rép. Pharm. Chimie*, No. 3, 1885.

Gelatina Glycerini (Glycerin Jelly).—Mix in a mortar 140 Castile soap and 210 glycerin; add, gradually, 1,680 expressed oil of almond (in cold weather only 1,260 will be necessary), and scent with 4 oil of thyme, 8 oil of bergamot and 2 oil of rose.—*L'Union Pharm; Ph. Ztg.*, No. 21, 1885.

Abrus precatorius.—The poisonous spikes, or “sui,” which are used in the Punjab for poisoning cattle, according to Boverton Redwood, are prepared as follows: The shell of the seed is removed, the seed softened in water and pounded into a paste, which is then rolled out into little cylinders, about $\frac{3}{4}$ inch long, sharpened at one end. After careful drying, the cylinders are further sharpened by being rubbed on a brick, and are finally soaked in animal fat. The suis are fitted, for use, into a wooden handle, from which the point just protrudes. Upon a blow being struck with this weapon, the point of the sui penetrates the flesh, the sui being withdrawn from the handle, into which it is loosely fitted, and remaining in the wound. Death ensues on an average in 48 hours.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 483.

TINCTURE DEPOSITS.¹

BY R. A. CRIPPS.

In November, 1883, I had the honor of reading before the "School of Pharmacy Students' Association" a report upon "Tincture Deposits," by which I mean that sediment which is formed in a tincture after filtration. (See "Amer. Jour. Phar.," 1884, p. 101.)

That report included notices of the following tinctures: Tinct. calumbæ, cardam. comp., chloroformi comp., cinchonæ comp., cinchonæ flavæ, ferri acetatis, gentianæ comp., ipecac., lobeliæ inf. æther., quiniæ and rhei, and it was there shown that the deposits in most of these are of little importance; the two cinchona tinctures and that of acetate of iron being exceptions to the rule.

I now purpose to continue that report, giving the results obtained with a few more deposits received since that time.

Tinctura Digitalis.—The deposit from this tincture is of a pale greyish-green color and small in amount. It was first washed slightly with proof spirit, then digested for a short time with dilute acetic acid, and the solution filtered. The filtrate was only slightly colored, it was shaken twice with chloroform, the chloroformic solution removed by a separatory funnel and evaporated slowly to dryness. The residue was then tested for digitalin by the following method: A few drops of strong sulphuric acid were added to the contents of the dish, and the vapor of bromine applied, a slight violet coloration was produced showing the presence of a small amount of digitalin; but it was very small indeed, quite insufficient for estimation, perhaps 5 per cent. of the whole deposit, which from 1 gallon of the tincture weighed barely 20 grains.

Tinctura Ferri Acetatis.—Another sample of this deposit having been sent to me I estimated the amount of ferric oxide it contained; this amounted to 76.44 per cent., showing that the deposit varies in composition, the former sample giving 69.77 per cent. It was similar in appearance to the last, and the quantity obtained from 1 pint was 33 grains.

Tinctura Lobeliæ Ætherea.—This deposit was similar in appearance to that previously examined, and like it contained no lobeline, but

¹ Read at a meeting of the "School of Pharmacy Students' Association." February 5, 1885.

proved to be a fatty body. It is no doubt formed by the slow evaporation of the ether rendering the fat less soluble. Another sample occurred in crystals, but was of the same nature in other respects.

Tinctura Nucis Vomice.—The deposit in this case was very suspicious, being white and in feathery crystals. It was carefully washed with rectified spirit, and the following tests applied:

1st. Sulphuric acid and bichromate of potash. No reaction for strychnia, only reduction of chromate.

2d. Nitric acid. Only faint yellow color.

3d. Sulphuric acid and gentle heat, an orange-red color, but scarcely like the loganin reaction of Messrs. Dunstan and Short.

4th. Boiling with dilute sulphuric acid, and action upon Fehling. None.

These results being negative, I proceeded to dry some, and in doing so noticed that it melted and gave a greasy stain to paper; this, together with the production of soap with caustic potash, proved it to be nothing but fat. Its melting point was found to be 117° F. From $\frac{1}{2}$ gallon of tincture only about 5 grains were obtained.

Tinctura Opii.—This deposit was very small indeed, and appeared as little whitish warty masses on the sides of the bottle. They proved to contain neither morphia nor meconic acid.

I have also received some few deposits which, from the very uncertain nature of their active principles, I have been unable to examine; they are tinct. cascarillæ, from Messrs. Thresh and Wright, and tinct. cuspariæ and sennæ, from Mr. Want, of Blackheath. I desire to thank these gentlemen and also others who have sent me these deposits. The remaining tinctures of the Pharmacopœia either deposit so slightly as to be unimportant and to make the examination of them a waste of time, or the drugs are themselves so little known that any examination is impossible.¹

From the results I have obtained we see that the tinctures of the British Pharmacopœia remain practically of the same strength for any reasonable time after preparation; that is, in so far as one may judge from the nature of their deposits, although of course changes may occur in the clear liquid by which the amount of active principle may be either raised or lessened, but this is not probable. It may be said

¹ I have since received a large deposit from Mr. J. O. Braithwaite which occurred in tinct. hyoseyami, the examination of which will shortly be published.

on this account that the present tinctures are a satisfactory series of preparations, and if made from drugs of good quality leave nothing to be desired in point of uniformity. But this is a great mistake, for a drug of good quality in one year may be very much stronger than a similar one in the year following, and even in the same year drugs may vary considerably in power and yet be very similar in physical characters. These statements are borne out by the results of Messrs. Braithwaite and Hogg in the case of cinchona, and by Messrs. Dunstan and Short in the case of *nux vomica*. These instances are especially selected because those experimenters worked upon the tinctures themselves; but much more might be added if we took the results of experiments upon the drugs. Mr. Hogg found in tincture of cinchona from 0.25 per cent. to 0.58 per cent. of total alkaloids, while Mr. Braithwaite's results showed a variation from 0.279 to 0.49 per cent. of total alkaloids, and from 0.070 to 0.345 per cent. of ether-soluble alkaloids. Messrs. Dunstan and Short have shown that tincture of *nux vomica* is equally liable to variation. Of twelve samples which they examined the total alkaloids varied from .124 to .360 per cent., while the strychnia ranged from .046 to .131 per cent.

From these figures, and they might be multiplied almost indefinitely, one draws the very natural conclusion that a series of tinctures standardized to a given percentage of active ingredient is a most desirable addition to pharmacy. But one is here met with the difficulty of determining what constituent of the drug shall be considered the active principle. The alkaloids or glucosides are no doubt by far the most potent constituents, but still they do not fully represent the drug, or there would be no need to use Pharmaceutical preparations at all. There must therefore be some other constituent which modifies the action of the alkaloid, and in most cases this is either unknown or extremely difficult of estimation. This is where analysis fails, and upon this Mr. Schacht has based an argument against standardization. Our present knowledge of drugs, he says, is not sufficiently accurate to justify us in bringing forward such preparations.

But, I ask, are we always to wait till our knowledge is absolutely perfect before we apply it to practical uses? I am afraid that if this were done we should never see the results of any scientific work. Besides, it is a general law of nature that things grow by use; if the child did not use his early power of moving his legs, would he ever learn to walk? If the mind were allowed to run riot and its powers

of thought left uneultivated, where would be our mathematicians, scientists or men of business? So with scientific knowledge. Use what we have for practical purposes and it will increase in the use. To apply it to the present case: by the practical working out of methods of titration a deeper knowledge of the constitution of a plant *must* follow, which will most certainly lead step by step to a thorough knowledge of its more indefinite constituents. The alkaloids alone do not represent the full activity of a plant, but it is fairly well established that a specimen containing 1 per cent. of alkaloid is stronger than one containing only .75 per cent., and therefore the activity of a drug may be measured by that alkaloid, since the other constituents are present in both cases.

This applies when there is but one alkaloid, but when there are two or more, as in cinchona or nux vomica, the difficulty is greater. In these cases it would perhaps be safest to standardize the most powerful to a definite amount; but the remaining alkaloids should also be kept within safe limits by the wise discrimination of drugs. For example, in the case of nux vomica tincture, .08 per cent. of strychnia is the average of Messrs. Dunstan and Short's results; but I think the nux vomica should be so chosen as to keep the brucia within the limits of .10 and .15 per cent., the highest and lowest of Mr. Short's being .24 and .075 per cent. The practical difficulties of dilution, etc., urged by Mr. Schacht against standard extracts, cannot be applied to tinctures, since there can be no objection to a little spirit more or less. Mr. Schacht seems rather to indicate that the medical profession does not call for such preparations. If this be the case I wonder at the use of the alkaloids at all; why do they not confine themselves to the old-fashioned infusions and extracts? The very fact of the immense use of alkaloids shows plainly that if standard tinctures and extracts are placed before the medical profession they will be largely and readily prescribed. One would scarcely expect a prescription to be written for standard tincture of opium, for instance, until some firm has brought out such a preparation; the patient could scarcely wait while the chemist devised a method for estimating it.

In regard to standard extracts which, like the tinctures, shall be constant in strength, I have not yet had sufficient experience to speak very strongly as to their feasibility, but I hope soon to be able to show that a series of them is not only desirable but also possible.—*Pharm. Jour. and Trans.*, March 21, 1885, p. 769.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

A new cotton plant. The account of which we published an abstract on page 116 of our February number, had been communicated by a correspondent residing in one of the Gulf States. From more recent correspondence we have become satisfied that a hybrid, as there described, between the cotton and okra plants has not been produced.

Herniaria glabra, Linné, is recommended by Zeissl in catarrh of the bladder; it is given in the form of infusion, 1 gram being used with the same quantity of *Chenopodium ambrosioides*, Linné, to 1 liter of boiling water. The addition of milk renders the infusion more agreeable.—*Allg. Med. Ztg.*

Herniaria belongs to the order Caryophyllaceæ, tribe Paronychieæ, and grows in sandy fields throughout the greater portion of Europe and Northern Asia. It is inodorous, has a saline, somewhat astringent and slightly bitter taste, and was formerly employed in dropsy, in diseases of the bladder and kidneys, and in hernia; it has long since fallen into disuse.

Conium maculatum, Linné.—Lepage corroborates the observations made by Orfila, that the root of this plant contains very little alkaloid. During the spring and summer of the first year, the quantity of alkaloid was very minute, but in September the root contained a larger proportion than could be obtained from roots of the second year's growth.—*Jour. Phar. Chim*, Jan., 1885, p. 10.

Guaiacum Resin.—J. S. Ward examined three samples of this resin and reported his results to the Liverpool Chemists' Association, at the meeting held Nov. 6 last. Petroleum spirit had no solvent action. Alcohol dissolved 96·22, 92·96 and 87·28 per cent; ether took up 88·89, 89·91 and 84·12 per cent., and water between 3·00 and 4·66 per cent. The alcoholic and ethereal extracts were found to be soluble in glacial acetic acid, and in liquor potassæ, but only partly soluble in chloroform and in ammonia. Two samples of the resin yielded ·299 and ·334 per cent. of ash, consisting almost wholly of calcium salts, while the third sample, which had yielded least to alcohol and ether, and most to water, gave 6·55 per cent. of ash.—*Phar. Jour. and Trans.*, Nov. 22d, p. 413.

Rasamalas.—Mr. E. M. Holmes states that the information obtained

from Mr. Jamie seems to confirm Hanbury's statement that this liquid storax is not obtained from the rasamala tree, *Liquidambar Altin-giana*, *De Candolle*. It is imported from Arabia and Persia, and is valued at \$30 per picul ($133\frac{1}{3}$ pounds). It is used for scenting clothes and rampah-rampah (spiceries), and for rubbing over the body, also for swollen testicles. It is mostly sent from Bombay to Java. The black and white rasamalas seem to be identical, the latter being probably colored for the market.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 482.

Myroxylon Pereiræ.—The volatile oil distilled from the fruit is described by Mr. E. M. Holmes as being almost colorless and of a sweet odor, recalling the fragrance of a field of beans in blossom. It is slightly altered by exposure to air, the odor approaching that of cedar wood. A solution of the oil in rectified spirit separates a white precipitate. The oil seems well fitted for use in perfumery, as it is not exactly like any known perfume.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 483.

Abrus precatorius, *Lin.*—The structure of the seeds has been described by W. Tichomiroff in a paper read before the Russian Society of Physicians and Naturalists at Odessa. They contain oil and granular albuminoids, but neither aleurone nor starch, and in the parenchyma sometimes crystals of stearic acid or hesperidin. The testa is composed of four layers, viz., (1) Rods, colorless in the red part, but purple-violet in the black spot; (2) Palisade cells, branching and at the lower end folded and of small diameter; (3) Parenchyma, tangentially elongated; (4) Albumen the cells of the inner layer being flattened radially and at length coalescing into a homogeneous pellicle which cannot be decomposed into its separate cells by maceration in chromic acid, and which swells strongly in caustic potash. The hilum has two layers of rods, and the palisade cells are replaced by sclerenchyma. By chloride of iron the presence of tannin can be recognized in the albuminous layer and rods.—*Pharm. Jour. and Trans.*, September 6, 1884.

Terminalia Chebula, *Retzius*.—The dried immature fruits furnish the Turkish drug "kara kalileh," the black myrobalans of old writers. They are shriveled, black, hard, $\frac{1}{3}$ to $\frac{3}{4}$ inch long, with a shining fracture and very astringent taste. Mr. Dickson states that the drug is a mild tonic laxative, in great repute among the Mecca pilgrims, probably because the hadjis tell them that the Prophet praised its virtues. It should be broken up into a coarse powder and swallowed, has a ligneous bitterish flavor,

and in the dose of a drachm acts as a very mild laxative. The Indian Pharmacopœia mentions the drug as combining mild purgative with carminative and tonic properties.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 483.

Chinese Rhubarb.—Mr. Wm. Elborne, Assistant Lecturer on Materia Medica, Owens College, states that Chinese or East Indian rhubarb consists of two varieties, of which one possesses the characteristic white lattice-worked venation with a red grained fracture, while the other possesses a longitudinal ramification of white veins with a black grained fracture. The first variety is referred by the author to *Rheum palmatum*, var. *tanguticum*, from which plant, the author believes, also the highly esteemed extinct Russian and Turkey varieties were obtained. The second variety is yielded by *Rh. officinale*, and agrees in all essential characters with the roots from this species cultivated by Rufus Usher, of Bodicote.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 497.

Homoquinine and cupreine.—The researches of O. Hesse and of B. H. Paul and A. J. Cownley (see "*Amer. Jour. Phar.*," 1884, pp. 515 and 575), have been supplemented by others made by the same authors.

O. Hesse (*Annalen*, vol. 206, p. 240), corroborates the observation of Paul and Cownley that homoquinine on being treated with caustic soda is split into quinine and cupreine, yielding approximately 52 per cent. of the former and 48 per cent. of the latter alkaloid. Cupreine crystallizes from ether in colorless concentrically grouped small prisms, melts at 191° C., dissolves in dilute sulphuric acid without fluorescence and this solution gives with chlorine and excess of ammonia the green color like quinine but less intense. The neutral sulphate crystallizes in delicate prisms sparingly soluble in cold water, and the chlorhydrate forms small needles. The alkaloid combines also with bases, the sodium compound crystallizing in colorless satiny scales. Homoquinine is a compound of the latter class and is obtained by crystallizing from ether a mixture in proper proportion of quinine and cupreine. The composition of the new alkaloid is being investigated by the author.

Paul and Cownley ("*Phar. Jour. and Trans.*," November 22, 1884, p. 401), obtained from homoquinine 62.37 per cent. of cupreine and 37.63 of quinine, and succeeded likewise in preparing homoquinine synthetically by crystallizing the mixed alkaloids from ether, quinine if used in excess, remaining in solution. A number of salts prepared

by the authors show that cupreine as well as homoquinine must be regarded as distinct alkaloids, and that the characters of the tartrate of the latter may to some extent account for the fact that De Vrij and others came to the conclusion that cuprea bark contains cinchonidine.

Cupreine.

Sulphate. Solutions easily supersaturated; at the surface the salt separates as minute white specks, which under the magnifying glass show radiating needles.

Acid Sulphate. Much less soluble than the homoquinine salt; the concentrated solution yields distinct tufts of radiating acicular crystals.

Hydrochlorate. Much less soluble than the homoquinine salt; distinctly crystallizable in bunches of long glassy needles.

Nitrate. Very soluble; distinctly crystallizable in tufts of long stout radiating needles.

Oxalate. Apparently uncrystallizable, the solution drying up to a resinoid residue, with a few crystalline spots.

Tartrate. Much more soluble than the homoquinine salt.

Hydriodate. Sparingly soluble in water; distinctly crystallizable without any sign of a resinoid deposit.

Acid solutions. No fluorescence.

Caustic Soda, 10 per cent solution. } Very soluble in the cold, and without decomposition.

Strong alcohol. Less soluble than homoquinine; crystallizes very readily in dense warty groups of minute crystals.

From ether. Crystals more massive than next, arranged in groups and conspicuously striated transversely.

Homoquinine.

Much more soluble than the cupreine salt; separates in slender needles, sometimes grouped in stellate bunches and presenting characters closely analogous to those of quinine sulphate.

By spontaneous evaporation the solution becomes syrupy and then solidifies as a gelatinous slightly fluorescent residue of very small bulk comparatively.

Solution in drying up leaves an amorphous resinoid residue.

Solution dries up to a resinous residue showing no sign of crystallization.

Much less soluble than the cupreine salt; delicate needles formed at the surface and becoming opaque on drying.

Very sparingly soluble, in many respects resembling cinchonidine tartrate.

Faintly yellow resinoid mass, very similar to that furnished by quinine salts with potassium iodide.

Very marked fluorescence.

Decomposed into quinine and cupreine.

Very soluble; solution dries up almost to an amorphous residue before showing any signs of crystals in minute bunches.

Very thin prismatic laminae, having characteristically shaped ends with two oblique planes.

Sarcocephalus esculentus, *Afzelius*, s. *Cephalina esculenta*, *Schumacher*, nat. ord. Cinchonaceae, grows from Senegambia to the Gaboon, from 16° N. lat. to 5° S. lat., and is known in the Sousou tongue as "doundake," in the Toncouleur as "jadali," in the Bassa country as "dorg," and in Sierra Leone as "amelliky." The root is sometimes

exported from West Africa under the name of *peach root*. Heckell and Schlagdenhauffen consider it valuable as an astringent and febrifuge and as a yellow dye. The bark is sometimes mixed with the bark of *Morinda citrifolia*, *Lin.*, *M. longiflora*, *G. Don*, and *M. Doundakee*, *Heckel*, the latter being regarded by Oliver as a variety of the second species. Doundake bark from Sierra Leone, when young, is grayish, smooth, somewhat fissured, and has small, hard, distant excrescences of a darker color; older bark becomes more blackish, the cracks multiply and the epidermis falls off as a reddish dust; the inner surface is ochrey yellow and striated longitudinally; the liber fibres separate easily in lamellæ; the bark has a bitter taste and tinges the saliva yellow, while the corky layer is astringent only. Doundake bark from Boké (Rio Nunez) differs in the absence of the blackish excrescences, the inner surface is of a darker yellow, the outer layer is less astringent and the liber is more bitter, but the anatomical structure is identical. The authors have not been able to obtain the alkaloidal principle indicated by Bochefontaine, Féris and Marcus, but have found the bitterness to be due to two nitrogenous coloring principles of a resinoid character, differing in their solubility in alcohol and water and having the formulas $C_{23}H_{19}NO_{13}$ and $C_{19}H_{16}NO_9$; the other constituents found are glucose, traces of tannin and a tasteless principle soluble in potassa. The morindas yield a bitter and astringent bark.—*Phar. Jour. and Trans.*, Jan. 31, 1885, p. 614; *Compt. Rend.*, C., 69.

Hedychium spicatum.—Nat. ord. Zingiberaceæ.—The plant is a native of the Himalayas, and the rhizome is known in Hindoostan as *kafur-kachri* or *kapur-kachri*, and is kept dried in slices which are $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter and from $\frac{1}{4}$ to $\frac{3}{8}$ inch in thickness. The transverse section is white and starchy and exhibits a large central portion, containing scattered minute vascular bundles, and separated by a faint line from the cortical portion. Externally the pieces are covered with a tough, wrinkled, reddish-brown epidermal layer. The taste is aromatic and slightly pungent. The odor may be described as intermediate between storax and rhubarb.

A proximate analysis, made by John C. Thresh, gave the following results: soluble in petroleum ether 5.9, soluble in alcohol (indifferent substance precipitated by tannin, acid resin, etc.) 2.7, glucoside or sugar 1.0, mucilage 2.8, albuminoids and organic acid 1.9, starch 52.3, moisture 13.6, ash 4.6, cellulose, etc., 15.2 per cent.

The benzin extract yielded colorless, inodorous, tabular crystals

which appear to be ethyl-methyl-paraconmaric acid, 2.9 parts of the extract consisted of fat with the odorous principle; a minute portion of this oily liquid dropped upon clothes renders them highly odorous for a considerable length of time, the odor recalling that of hyacinths.—*Phar. Jour. and Trans.*, Nov. 8, 1884, p. 361.

SOME EXPERIMENTS ON STRYCHNINE.

BY W. A. SHENSTONE,

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In 1883 ("Trans.," p. 101), I read a paper before the Society showing that brucine contains two methoxyl groups, and is probably a dimethoxyl derivative of strychnine, as represented by the formula $C_{21}H_{20}(CH_3O)_2N_2O_2$. I have been unavoidably delayed in the further examination of this question, but am now working upon it in conjunction with Mr. A. Richardson.

Meanwhile, my experimental results have been in some degree confirmed by the work of A. Hanssen (*Ber.*, vol. 17, p. 2266), who has obtained methyl chloride and a complementary base from brucine by the use of the same reagent that I employed, viz., hydrochloric acid. Apparently Hanssen was unaware of my experiments, and he has not carried the action so far as I did, nor has he noticed its probable bearing on the relationship between the two alkaloids in *nux vomica* beans. Since this relation between these bodies occurred to me, I have been much interested in the constitution of strychnine, and, amid many interruptions, have lately made the experiments recorded in this paper. Meanwhile several other chemists have also turned their attention to the subject. Thus, Plugge ("Chem. News," 1883), by oxidizing it with potassium permanganate, has obtained an acid, $C_{11}H_{11}NO_3 \cdot H_2O$; Hanriot has re-examined nitrostrychnine; Goldschmidt (*Ber.*, vol. 15, p. 1977) has recognized, qualitatively, indole as a product of the distillation of strychnine with caustic potash; and Seichilone and Magnanini ("Gazzetta," vol. 12, p. 444) believe that by distillation with zinc-dust they have obtained a new isomeride of the known luidines from strychnine.

At the end of my last paper, I expressed my intention of working on strychnine in future, as I had reason for thinking it would prove more satisfactory than brucine; and at the subsequent suggestion of

Dr. Armstrong, who I believe some years ago had a similar object in view, I decided to employ its bromo-derivative, as likely to give better results, and in order that at the same time the physiological action of this compound might be examined. This, as a subsequent paper will show, has been done by Dr. Lauder Brunton.

The halogen compounds of strychnine have been already incompletely investigated, Herapath and Tilden having prepared some iodine compounds, and Laurent those of chlorine and bromine.

Laurent observed that when bromine is added to a strong solution of strychnine hydrochloride and the resinous precipitate is filtered off, the solution yields to ammonia a precipitate of bromostrychnine, crystallizing from spirit and forming a crystalline hydrochloride. As I had reason for thinking that nearly all the alkaloid would be precipitated as resin if this method were followed, I attempted, but without success, to prepare bromostrychnine by adding a solution of bromine in chloroform to solution of strychnine in the same solvent. I found, however, that by adding bromine-water to the hydrochloride dissolved in 50 to 100 times its weight of water, no considerable proportion of resin was formed till two equivalent proportions of bromine had been added. From this solution, alkalis threw down a solid, insoluble in water, and crystallizing beautifully from warm alcohol; this evidently corresponded with Laurent's compound. There was no difficulty in completely converting strychnine into this substance.

A portion was crystallized in two fractions. 0.2626 gram of the first fraction gave 0.1188 gram silver bromide, equivalent to 19.23 per cent. of bromine; 0.3070 gram of the second fraction gave 0.1383 gram of AgBr, equivalent to 19.15 of bromine.

Theory for $C_{21}H_{21}BrN_2O_2$ requires 19.37 per cent. bromine.

The platinochloride of this compound is not quite stable; its color slightly changes during drying. A specimen was examined, however, and was found to contain 17.2 per cent. Pt, as against 16.03 required by the above formula.

The crystallography of bromostrychnine is given in a separate note by Mr. H. A. Miers. The crystals are rectangular tables of the rhombic system; $a:b:c = 1.45907:1:1.19457$.

I found bromostrychnine to be fairly soluble in cold, and more so in hot alcohol; also soluble in chloroform. It unites very readily with methyl iodide, the methiodide separating in crystals when methyl iodide is added to an alcoholic solution of monobromostrychnine.

Monobromostrychnine forms a hydrochloride, which, on evaporation, yields gelatinous masses, and these soon set into silky needles.

Having observed that by the addition of four equivalent proportions of bromine to solutions of strychnine practically all the strychnine is thrown down as the resin mentioned by Laurent, I was led to suspect its nature. If precipitated at about 40° , it can be secured easily as a bright yellow powder, which slowly evolves bromine, is insoluble in water and chloroform, but soluble in alcohol. On analysis, 0.1262 gram gave 0.1293 gram of AgBr, equivalent to 43.58 per cent. of Br. It is therefore dibromide of monobromostrychnine, $C_{21}H_{21}BrN_2O_2, Br_2$ (which requires 41.8 per cent. bromine), a little contaminated with some other more highly brominated substance. This was confirmed: 1. By the fact that the same body is thrown down on adding bromine to solution of bromostrychnine. 2. That by the action of ammonia, it is changed to a white substance, having all the properties of bromostrychnine. A specimen of bromostrychnine made in this way was found to contain 21.17 per cent. of bromine, theory requiring 19.37. This is what would be expected from the above facts.

Dibromostrychnine.—When the above precipitate is heated with its mother-liquor for some hours, it presently dissolves. This led me to hope that dibromostrychnine was formed by the reaction $C_{21}H_{21}BrN_2O_2, Br_2 = C_{21}H_{20}Br_2N_2O_2, HBr$.

Analyses of the products always show great deficiency of bromine, so there is no doubt that oxidation occurs. Neither did I succeed in effecting the above reaction by heating the dry solid, or by exposing it to sunlight. If, however, solution of bromine in chloroform is added cautiously to a solution of strychnine in the same liquid, there is not much precipitation until two equivalents of bromine have been added. After that, it is rapidly precipitated, probably as a dibromide, analogous to that above described. If the addition of bromine is stopped at the right point, and the solution is treated with alkali, it gives, on evaporation, a resin-like residue, rather easily decomposed by heat; this does not appear to be crystalline. Analysis of a specimen showed it to contain 35.3 per cent. of bromine; so probably it is dibromostrychnine with the formula $C_{21}H_{20}Br_2N_2O_2$, which requires 32.5 per cent. Br, contaminated with some more highly brominated product. Although I have not succeeded in its purification, I hope it will prove useful in some future work.

Chlorostrychnine.—Before proceeding to describe my further experiments with bromostrychnine, I may point out that, although I have not made any experiments on chlorostrychnine, yet the above affords an explanation of the discordant results obtained by Laurent and Pelletier.

The former, by a method analogous to that by which he obtained bromostrychnine, prepared a substance which yielded a crystalline sulphate, and was shown by analysis to be chlorostrychnine, $C_{21}H_{21}ClN_2O$; whilst Pelletier, by completely precipitating a solution of strychnine with chlorine, obtained a compound which contained 24.57 per cent. of chlorine. From the mode of its formation, and from the fact that the formula for dichloride of monochlorostrychnine requires 24.2 per cent. of chlorine, I think there can be no doubt that Pelletier's compound stands in the same relation to Laurent's that the above described dibromide does to Laurent's monobromostrychnine; so that for the present I have not thought it necessary to examine them, although possibly they may be of value in the future progress of this work.

Action of Nitric Acid on Bromostrychnine.—When this compound is heated with excess of strong nitric acid for some hours, copious red fumes are evolved, and the bromine appears to be almost entirely expelled. On concentrating and diluting, a resinous precipitate forms, which consists of the nitrated bodies that have been examined with somewhat varying results by Nicholson and Abel, Claus, Hanriot, and others. The amount of this resin represents a very large proportion of the materials used. The liquid separated from this precipitate was found to have a bright yellow color, and dyed silk. On neutralizing it with potassium carbonate and concentrating, a crop of crystals was obtained which resembled potassium picrate in appearance and solubility; they were explosive. After recrystallization, a portion was examined quantitatively.

0.2386 gram gave 0.0758 gram of K_2SO_4 . This is equivalent to 14.2 per cent. of potassium. The picrate requires 14.6 per cent.

The acid itself was isolated by extraction with ether from an acid solution of the salt. The residue, on evaporation, melted at about 120° ; it is therefore the 1:2:4:6 trinitrophenol.

On repeating the above treatment with strychnine itself, I got a similar result. When I used ordinary strong nitric acid, I secured $6\frac{1}{2}$ per cent. of picrate; so that allowing for the inevitable loss in working on a small scale, probable the amount was not less than 10 per

cent.; and as I estimate that at least half the strychnine remained in the form of insoluble nitrostrychnines, this may be regarded as representing perhaps nearly 20 per cent. of the material actually acted on. When fuming nitric acid was employed, the yield was rather greater, for 12 per cent. of potassium salt was secured. It was, however, accompanied by another substance which could not be removed except with considerable loss, so that the exact amount of picrate was uncertain.

It is singular that this formation of trinitrophenol in a reaction that has been so frequently studied, should have been overlooked hitherto. It is of considerable interest, for it appears to indicate, in the first place, that strychnine contains a benzene-ring of carbon-atoms, and secondly, that it may perhaps contain one or more hydroxyl-groups; the latter inference is supported by the behavior of strychnine under the action of the alkaline oxidizing agents used. This, if correct, is important, as there are so few cases among the alkaloids in which the manner in which the oxygen is united is known.

I am continuing my experiments on this subject, and hope to be able to carry on the work without interruption in the future, and also to extend my observations to other alkaloids.—*Jour. Chem. Soc.*, March, 1885, pp. 139.

THE ACTIVE PRINCIPLE OF SENNA LEAVES.¹

BY RALPH STOCKMAN, M.B.,

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Although the literature of the senna plant, as given by Martius,² is very extensive, and dates at least from the year 1496, it was not till 1821 that a systematic attempt was made to determine the nature of the active principle, and the other constituents of the leaves. In that year, Lassaigne and Feneulle³ investigated the subject very fully, and described as the active principle a body which they named cathartin. As their results afterwards became the subject of a good deal of discussion and contradiction, it may be interesting to describe briefly the method by which they obtained cathartin.

¹ Read at a meeting of the North British Branch of the Pharmaceutical Society, February 18.

² "Versuch einer Monographie der Sennesblätter," Leipzig, 1857.

³ *Annales de Chimie et de Physique*, xvi, 1821.

The watery decoction of the leaves was treated with acetate of lead, filtered, the excess of lead in the filtrate removed by sulphuretted hydrogen, and the sulphide of lead got rid of by again filtering. This second filtrate was then evaporated to dryness, and treated with spirit of wine, the alcoholic solution being subsequently evaporated to the consistence of an extract, again treated with spirit of wine containing sulphuric acid (to precipitate the sulphate of potash which is insoluble in alcohol), and filtered. The excess of sulphuric acid was neutralized with acetate of lead, and the excess of the latter removed in its turn with sulphuretted hydrogen. On evaporating the liquid, cathartin was obtained. They describe it as being yellow in color, actively purgative, and give an account of its solubility in various menstrua. They also isolated a body which they thought to be the coloring matter of the leaves. Heerlein,¹ however, found that cathartin prepared as above was quite inert as a purgative, and that the same holds good for the tincture made from the leaves with strong alcohol.

There appeared about the same time several other papers on senna, none of which are of much importance with the exception of one by Bley and Diesel.² These chemists obtained a brown extractive body which they considered identical with cathartin, and a yellow resin which they named chrysoretin, on account of its resemblance to chrysophanic acid. They took the chrysoretin in doses up to 30 grains, the brown resin to 60 grains, and the cathartin to 90 grains without causing diarrhoea. They came to the conclusion that the taste, odor and purgative qualities of the drug depend on the combined action of the brown extractive matter and the chrysoretin, and that the inorganic salts and other constituents of the drug are quite inert.

Following this came a series of papers from Buchheim's laboratory. The first of these is by Tundermann,³ who stated that the active principle is very sparingly extracted by alcohol of 85 per cent. strength, and therefore tried to obtain it by precipitating the watery infusion with strong alcohol. The resulting precipitate when dried formed a brown powder, which was strongly purgative. He states positively that it is not the cathartin of Lassaigne and Feneulle, but thinks that

¹ *Pharmaceutisches Centralblatt*, 1847.

² *Archiv der Pharmacie*, Bd. 105.

³ "Meletemata de Sennæ Foliis," Dorpat, 1856.

the body which is excreted in the urine and which gives the well-known reddish coloration on the addition of an alkali, is identical with the chrysoretin of Bley and Diesel. Sawicky¹ treated the watery infusion of the leaves with acetate of lead, decomposed the precipitate with sulphuretted hydrogen, and then extracted with alcohol, which took up all the active principle. On evaporating the alcohol he obtained a body which readily combined with calcined magnesia—the combination so formed being very purgative. His conclusions are of importance, viz., that the active principle is an organic acid soluble in alcohol, but the salts of which are quite insoluble in that menstruum.

The further investigations, two in number, conducted under Buchheim's direction, call for little mention, except that in one of them the active principle was first named cathartic acid.

In the "Monographie der Sennesblätter" of Martius we find a long account of the botanical sources, etc., of the senna leaves, but only a comparatively short portion of the book is devoted to a consideration of their chemistry. He examined the so-called cathartin carefully, and found it to consist of a mixture of inorganic acids and bases, coloring matter, sugar, etc., and also that it is non-purgative. By digesting the leaves with dilute soda solution, adding sulphuric acid, and allowing the sulphate of soda to crystallize out, he obtained from the crystals, on shaking them up with ether, a yellow body, which he says consists of chrysophanic acid, phaeoretin and aporetin (the same bodies as are found in rhubarb). The chrysophanic acid was in such small amount that he had not enough to apply the ordinary chemical tests to, and yet he gives as his opinion that it is the sole active constituent in the leaves. Chrysoretin he found to consist of a volatile oil and coloring matter.

The most valuable contribution to the subject, however, is that of Kubly.² He evaporated *in vacuo* the watery infusion of the leaves to the consistence of a syrup, and then, by adding an equal quantity of alcohol, threw down the inorganic salts and mucus. The filtrate was precipitated with large excess of alcohol, the precipitate dissolved in water, and again precipitated with alcohol. This was repeated again and again, hydrochloric acid being finally used to precipitate albu-

¹ "Quedam de Efficaci Foliorum Sennæ," etc., Dorpat, 1857.

² *Ueber das wirksame Prinzip und einige andere Bestandtheile der Sennesblätter*, 1865.

minous substances. He describes the acid as shiny black in color and non-crystalline, insoluble in ether, absolute alcohol and water, but soluble in dilute alcohol. He assigns to it the formula $C_{180}H_{95}O_{82}N_2S$, and shows that it is a glucoside, being easily split up into glucose and a body which he names cathartogenic acid. In addition he gives some experiments to show that it is a colloid and diffuses with great difficulty through animal membranes.

Rau¹ obtained a crystalline body which he named sennin, but Kubly² has since shown that it consists simply of sulphur and a bitter stuff.

More lately Bourgoïn and Bouchut³ have stated that in the leaves there are three purgative bodies—chrysophanic acid, cathartic acid and another unnamed substance. They do not appear, however, to have tested the physiological action of the bodies which they separated.

The above is as brief an account as possible of all the literature on the subject which I have been able to find. The results of Kubly are those which are to be found in most of the standard text-books of the present day, but the formula which he has assigned to cathartic acid rouses the suspicion that he was not dealing with a pure body but with a mixture. This idea, coupled with a desire to investigate more fully the action of senna as a purgative, led me to undertake a further investigation of the subject.

In my first attempts to isolate the acid I used as precipitants various salts of lead, lime, copper and soda, but invariably obtained by these methods a substance, which although strongly purgative always contained a considerable amount of nitrogen. Finally, baryta was used, and by its use a pure cathartate may be got. The method which was finally adopted was as follows: The fol. sennæ spiritu extracta were thoroughly moistened with very dilute sulphuric acid in order to set free the cathartic acid from its salts, and then all the matters soluble in cold or hot alcohol were extracted.⁴ The alcoholic solution was then precipitated with hot saturated solution of baryta, which was added until it no longer gave a precipitate. The whole was then filtered, the residue well washed, and having been put into a glass vessel a stream of carbonic acid gas was passed through it for some hours.

¹ *American Journal of Pharmacy*, 1866.

² *Vierteljahrsschrift f. prakt. Pharm.*, Bd. xvii.

³ *Jahresbericht über die Fortschritte der Chemie*, 1871.

It was again filtered, and as the CO_2 does not decompose all the cathartate of baryta the cathartic acid is found partly free in the filtrate and partly as cathartate of baryta in the residue on the filter. The latter, after treatment with sulphuric acid and filtering, yields a light brown colored filtrate, which was repeatedly shaken up with ether to remove the coloring matter arising from a slight decomposition of the cathartic acid. It was then carefully neutralized with lead carbonate or oxide at a very slightly elevated temperature, filtered, and so much alcohol and ether added to the filtrate that a moderate precipitate occurred. After again filtering, the filtrate was treated with very great excess of alcohol and ether, the resulting precipitate of cathartate of lead collected on a filter, washed with alcohol, and dried *in vacuo* over sulphuric acid. There remains in the alcohol-ether, however, a considerable quantity of cathartic acid, because the neutral cathartate of lead seems during the precipitation to form both a basic and an acid salt, the latter of which is not thrown down.

To obtain the baryta salt, the same method practically is used barium hydrate being substituted for lead. The neutral solution, however, is only very slightly precipitated by alcohol-ether, and hence baryta water must be added to it, thus greatly facilitating the precipitation.

In the filtrate obtained after treating the original barium precipitate with CO_2 there is also a large amount of cathartic acid, which may be recovered by adding acetate of lead, treating the precipitate with sulphuric acid, filtering, and then adding to the filtrate baryta water. The resulting precipitate is then washed and from it either the lead or barium salt obtained as before.

By this method a large quantity of the cathartic acid is undoubtedly lost, unless the various filtrates and precipitates be re-worked, but after trial of many other methods and modifications of this method, I have found that by it the purest specimens of cathartic acid are obtained. The chief points in it are: (1) that the solutions of the active substance must never be evaporated by, or even exposed to heat, as thereby, whether the solution be acid, alkaline or neutral, decomposition is certain to ensue. This was proved by a series of special experiments. And (2) the use of H_2S must be avoided, as it was probably from this that the sulphur in Kubly's acid arose.

The salts have the following characteristics: Cathartate of lead is a non-crystalline, grayish powder. The neutral salt is readily soluble

in water, the basic salt insoluble, or nearly so, and on treatment with water, the former splits into an acid and basic salt. The baryta salt behaves in the same way. When in mass it is almost black in color, but when finely powdered becomes yellowish red. When quite pure neither salt contains either *nitrogen* or *sulphur*, and hence the presence of these bodies in Kubly's cathartic acid must be attributed to impurities. If the salts be decomposed with sulphuric acid and then filtered, a clear brown solution of the free acid is obtained. The test for its purity consists in agitating it with ether, when the latter should remain quite colorless. It is almost tasteless.

Comparatively few experiments were needed to demonstrate the physiological action of cathartic acid.

A solution of the free acid was carefully neutralized with sodium carbonate, and a portion of it given by the mouth to a rabbit. Within an hour very violent diarrhœa occurred, which lasted for two or three hours, at the end of which time the animal died. Smaller doses caused simply violent diarrhœa. The urine in all cases gave a red color on the addition of caustic potash, just as it does when the ordinary pharmacopœial preparations of senna leaves have been administered. *Post-mortem* examinations were made in four cases, when the only changes found were inflammation and hyperæmia of the intestinal mucous membrane.

It has been stated that the senna preparations, when injected directly into the blood, are capable of causing purgation,¹ and to test this a series of experiments was made. I began by giving small doses subcutaneously and by the jugular vein, but, finding them without effect, increased the dose given until it was twice as large as that which had caused violent diarrhœa and death when given by the mouth. In no case did purgation follow the administration. The animal simply appeared out of sorts for the next few days, probably chiefly from the effects of the operation. In all these cases the urine gave the caustic potash reaction, showing that the cathartic acid had become decomposed in the blood.

The investigation of the chemical relationships and decomposition products of cathartic acid offers many difficulties, owing largely to the instability of the bodies with which one has to deal and to the small quantities obtained.

¹ Compare Nasse "Beitr. zur Physiologie der Darmbewegung," Leipzig, 1866; Wood "Treatise on Therapeutics," 3d edit., p. 464.

If the solution of the acid or one of its salts be boiled for a few minutes with a dilute mineral acid, the clear solution becomes turbid and throws down a yellowish brown precipitate mixed with black flecks; these latter collect themselves into a black mass, and finally form the only decomposition product which is insoluble in water. It is the cathartogenic acid of Kubly (also purgative), but contains other bodies as well. In the filtered solution there is present a kind of glucose which reduced Fehling's solution, but could not be got to ferment with yeast. Boiling with caustic potash also decomposes cathartic acid, but the products were not investigated.

The yellowish brown precipitate was next examined. It was separated from the other matters present by agitation with ether, which dissolves it, the yellow ethereal solution being then poured off. On evaporating the ether a light orange-colored resinous-looking body is left behind. It is insoluble in water, but was purified by dissolving it in a small quantity of sodium carbonate solution from which it was precipitated by the addition of hydrochloric acid, the precipitate being collected on a filter, well washed with water and finally dissolved in alcohol. On evaporating the alcohol, a dark brown amorphous body is obtained, which however consists of various constituents. On treating it with ether a portion of it only is dissolved, the solution being of a pure yellow color. This body is also amorphous, and on the addition of an alkali gives a bright cherry-red color, being probably the substance which gives this reaction in the urine. It, however, is also not a simple substance, as it undergoes further changes on being boiled with an acid.

Among the decomposition products of cathartic acid is also found a body which is present in commercial chrysarobin. It is obtained from chrysarobin by treating the latter with ether, whereby a small portion of it is dissolved. The ethereal solution is then washed with very dilute potassium hydrate, and the substance obtained by allowing it to crystallize out from a hot alcohol-chloroform solution. This body is almost identical with chrysarobin, but differs from it in so far as that when dissolved in strong caustic potash and exposed to the air it is not oxidized into chrysophanic acid, and in fact seems to undergo no change whatever.

If this body be oxidized by boiling it with Fehling's solution, and after the addition of HCl the whole be shaken up with ether, a portion of it is dissolved. The ethereal solution is dichroous, being by

direct light of a beautiful emerald green and by reflected light of a fine red color, just as chlorophyll is. Its absorption bands in the spectrum are also very similar to those of chlorophyll. The amount of this coloring matter is very minute, the principal product, after the above treatment with Fehling, being a body of a pure reddish brown color which is insoluble in alkalies, acids and other menstrua, and only very sparingly soluble in boiling chloroform and acetic ether, to which it imparts a violet color. If cathartic acid, after being decomposed by boiling with dilute HCl, be treated in the same way with Fehling, etc., the product gives exactly the same reactions. The reaction could invariably be obtained with chrysarobin, but not with cathartic acid, the explanation probably being that with too little boiling the body is not formed, and with too prolonged boiling it is further decomposed. Nothing definite could be made out as regards its relations to cathartic acid.

From the results given above it may be safely inferred that cathartic acid is a colored glucoside. On boiling with acids a simple decomposition into glucose and the coloring matter does not take place, because at the same time a whole series of intermediate products are formed, the investigation and identification of which would consume a vast amount of time. From the results of a few experiments which were afterwards made it seems probable that the difficulties would be lessened by using KHO instead of HCl to decompose the acid.

An ultimate analysis to determine its formula was not made, because in a free state it is so easily decomposed and therefore difficult to obtain quite pure, and also because it was so difficult to obtain its salts otherwise than as a mixture of the neutral and basic cathartates. All the purgative substances which up to the present time have been separated, either pure or as decomposition products of glucosides from rhubarb, senna and rhamnus—viz., chrysophanic acid, cathartic acid, emodin and many other unnamed bodies—act locally as irritants, and hence as purgatives when introduced into the alimentary canal. A colloid glucoside like cathartic acid has an especially violent action, as it is absorbed with great difficulty, and hence traverses the greater part of the intestines. Its decomposition products act in the same manner.

In conclusion, I have to express my thanks to Professor Schmiedeberg, of Strassburg, for much valuable advice while carrying out this investigation.—*Phar. Jour. and Trans.*, March, 1885, p. 740.

THE ACTIVE PRINCIPLE OF INDIAN HEMP.¹

BY SURGEONS WARDEN AND WADDLE,

Bengal Medical Service.

One of the most serious drawbacks to the medicinal use of this powerful drug (*Cannabis Indica*) is that we cannot depend upon its preparations being possessed of activity; moreover, the large amount of resin in each dose is often productive of gastric disturbance. These objections would at once be overcome were we able to extract from the resin its active principle.

Since 1839, when Sir W. O'Shaughnessy, of Calcutta, brought the peculiar properties of Indian hemp prominently to the notice of the medical world,² several attempts have been made to isolate the active principle of the plant with remarkably conflicting results.

In 1846, Smith³ separated a resin which he called "cannabin," and which he believed to be the active principle; and said that it possessed much narcotic activity. No subsequent observers, however, have been able to obtain by the process employed by Smith, any body which fully answers to the description of Smith's "cannabin."

In 1857, Personne⁴ resolved the volatile oil, obtained by distillation of the plant, with water, into cannabene ($C_{15}H_{20}$), a light hydro-carbon, and a solid crystalline hydride of cannabene ($C_{15}H_{22}$). He states that inhalation of the vapor of cannabene produces a powerful physiological effect, and he claims it as being the sole active principle of Indian hemp.

In 1876, Preobraschensky,⁵ operating on "hashish" got from Turkestan, asserted that the active principle was not a resin, but an alkaloidal body, which he recognized as nicotine, the volatile liquid alkaloid of tobacco. It has been suggested that the presence of nicotine might be due to the hemp having been mixed, as it sometimes is in the bazaars, with tobacco, but Preobraschensky states that he obtained this nicotine from the flowering tops of the plants as well as from the commercial resin.

Merck, of Darmstadt, applies the term "cannabin tannin" to a glucoside contained in Indian hemp which he has combined with tannin. This preparation is not possessed of powerful activity, and frequently is inactive. By treating this tannin compound with zinc oxide Herr Bombelon obtained a substance which he named "cannabinum," as a greenish-brown powder not agglutinating upon exposure to the air and volatilizing without residue on platinum foil.⁶

In 1881, Siebold and Bradbury reported to the British Pharmaceutical Conference that Indian hemp does contain a volatile alkaloid which, how-

¹ From the *Indian Medical Gazette*

² "On Indian Hemp or Gunjah," Calcutta, 1839; also "Bengal Dispensatory," Calcutta, 1842, pp. 579-604.

³ *Pharm. Journ.*, vol. vi., p. 171. In *Ph. Jour.* April 18, 1885, Thos. Smith describes the effects upon himself of his cannabin, and states that it was not a simple principle and after keeping for three years, had become inert.

⁴ *Journal de Pharm.*, xxxix., p. 48.

⁵ *Pharm. Zeitsch. f. Russland*, p. 705.

⁶ *Pharm. Zeit.*, May 10, 1884.

ever, does not possess the characters of nicotine. They called it "cannabinine" and obtained only 2 grains from 10 pounds of hemp. They do not appear to have tested its action physiologically, and so have left it undetermined whether this volatile alkaloid be really the narcotic principle of hemp.

The above chemists thus obtained widely different bodies, yet each individually believed that the substance which he isolated represented the active principle of the drug. With the subject thus involved, and having at hand a supply of fresh and active hemp, we undertook an examination of the plant in the endeavor to isolate its active principle. Since commencing our observations, Dr. Matthew Hay has reported¹ that he has isolated an alkaloid in the form of colorless, needle-like crystals, which, however, did not possess the narcotic properties of the plant, but produced tetanus in frogs in exactly the same manner as strychnine—though not chemically identical with it. Dr. Hay, therefore, called this alkaloid "tetano-cannabin." It must exist in the plant in exceedingly minute traces, for only a few grains were obtained from 1 kilogramme of hemp. He considers it a secondary alkaloid of the plant, and not the chief active principle. We have specially investigated this point as to whether the plant contains an alkaloid with tetanizing properties.

The following is a preliminary note of some of our results: One thousand grams of the flowering tops and leaves of Indian hemp of ascertained activity were roughly powdered and then moistened with 1 litre of a 5 per cent. solution of sulphuric acid and allowed to digest at a temperature of 65°F. This mixture was then packed in a percolator and percolated with about 1 litre of distilled water till the fluid which passed through was colorless.

This fluid, after filtration, measured 1½ litres, and was of a dark sherry color, smelling very strongly of the characteristic odor of the plant. Carbonate of lime was added to neutralize the free acid, and carbonate of soda solution to render it alkaline. On the addition of the soda a copious precipitate fell down. The unfiltered mixture was then well agitated with ether; and this ethereal layer, which ought to contain any alkaloidal body soluble in ether, was afterwards drawn off and allowed to evaporate spontaneously.

The subjacent liquid which remained after removal of the ethereal layer was evaporated on the water-bath to dryness and then boiled with absolute alcohol and filtered, and the filtrate evaporated on the water-bath. This ought to contain Hay's tetano-cannabin, which is freely soluble in alcohol, but sparingly so in ether.

The ethereal layer, yielded on evaporation about half a gram of a yellowish-brown extract which was insoluble in water, but soluble in a weak solution of carbonate of soda. Of this extract 0.25 gram was injected into the stomach of a young cat without the slightest effect.

The alcoholic solution yielded about 3 grams of a dark greenish-brown extract with a very fragrant aromatic odor. The whole of this was rubbed up well with water and carbonate of soda solution (Hay's alkaloid is "easily

¹ *Pharm. Journ.*, 1883, p. 998.

soluble in water"); and frequently shaken up with ether. The ethereal layer was then siphoned off and the ether driven off by evaporation on the water-bath, giving about .2 of a gram of an amorphous light brown substance, which was soluble in about twenty times its weight of distilled water. This watery solution was neutral in reaction. Half of it was injected hypodermically into the thigh of a cat without any positive result.

It will thus be seen that although operating on so large a quantity of the plant of ascertained activity, we were unable to find any evidence of the existence of such a principle as Dr. Hay describes.

As many of those addicted to the hashish form of intemperance obtain the intoxicating effects by smoking the plant in a pipe, it is to be expected that destructive distillation of the freshly prepared resin might yield up the active principle. This process was, therefore, resorted to. By the destructive distillation of the freshly prepared alcoholic extract of the plant to which an excess of caustic potash solution had been added, an amber colored oil was obtained, which, by exposure to the air or the action of alkalis, rapidly became of a dark reddish-brown color. This oil had a mildly empyreumatic odor which was distinctly tobacco-like. Its taste was warm, aromatic and somewhat terebinthinate. The oil contained phenol, ammonia and several other of the usual products of destructive distillation.

The nicotine-like principle contained in this oil appeared to be alkaloid. It formed salts which evolved a strong nicotine-like odor when acted on by alkalis. But physiologically it was found to be inert, and, therefore, was evidently not identical with nicotine.

The oil as a whole was also found to be devoid of any narcotic or irritant qualities. About one-eighth of an ounce was introduced into the stomach of a cat without producing any sensible effect. These results do not coincide with those of Personne, who asserted that the active principle of the plant resided in the volatile oil. It is just possible that the active principle was decomposed by the high temperature necessary for destructive distillation.

The principle which represents the full activity of the plant has yet to be isolated. If the active principle be a body which is actually distinct from the resin, the fact of its being so intimately associated with the resin renders its separation a matter of peculiar difficulty, for it is remarkably difficult to deal chemically with resinous compounds.—*Phar. Jour. and Trans.*, January 17, 1885, p. 574.

VALUE OF CONVALLARIA MAJALIS.—The glitter of novelty is wearing away, and after two or three years of universal praise we find that Lily of the Valley is exciting some doubts as to its medical value. Leubascher affirms that grains $\frac{1}{2}$ of convallarin produces paralysis and loss of reflex activity in frogs, and in animals a progressive fall of arterial pressure, with slowing of the pulse and final diastolic arrest of the heart. Pel. Leyden and Stiller agree with Leubascher in finding no therapeutic utility in its employment. Prof. E. T. Bruen, in our own country, says that it can be employed with reasonable confidence in functional cardiac disorders and in mitral obstruction, and that, in comparison with digitalis, it acts more as a cardiac regulator, but much less as a cardiac stimulant.—*Therapeutic Gazette*; *Pacif. Med. and Surg. Jour.*, April, 1885.

VARIETIES.

LIQUID EXTRACT OF CINCHONA containing 5 per cent. of mixed alkaloids, is now recommended by Professor Redwood to be prepared as follows : One pound avoird. of red cinchona bark in No. 60 powder is exhausted, by digestion and percolation, with $\frac{1}{2}$ fluidounce of hydrochloric acid and distilled water, and the percolate is evaporated below 180° F. to the consistence of a firm extract. If on dissolving 30 grains of this extract in 2 drachms of hot distilled water it gives more than a slight precipitate on cooling, the whole of the extract should be similarly treated and the clear liquid again evaporated to the consistence of a solid extract, the alkaloidal strength of which is to be determined.

The liquid extract is then prepared by taking as much of the solid extract as contains 1 ounce of total alkaloids, adding 5 fluidounces each of glycerin and water, heating over a water-bath until solution is effected, and when cool, adding 5 fluidounces of alcohol and as much water as is required to make the product measure 20 fluidounces.—*Phar. Jour. and Trans.*, December 6, 1884, p. 441.

FLUID EXTRACT OF ERGOT, in doses of 5 to 20 drops 4 or 5 times a day has been found advantageous by Dr. G. L. Magruder, of Washington, in dysentery of children.—*Virg. Med. Monthly*.

ERGOT IN PULMONARY DISEASES.—According to the "London Medical Record," ergot is of advantage in congestions of the lungs, as in pneumonia and acute bronchitis, relieving the hemorrhagic sputa, difficult expectoration, dyspnoea, fever and delirium.—*Pac. Med. and Surg. Jour.*, April, 1885.

QUEBRACHO.—Drs. Huchard and Eloy, of Blois, affirm that the six alkaloids of Quebracho reduce temperature in fevers even more effectually than quinine. Such a result is obtained in typhoid by the hypodermic injection of gr. $1\frac{1}{2}$ to 3 of muriate of aspidospermine.—*Pacific Med. and Surg. Jour.*, April, 1885.

CHLORAL IN ALBUMINURIA.—Dr. Wilson has treated a few cases of albuminuria with this drug, and has noticed that by its constant use he was able to cause a complete disappearance of albumin from the urine, the albumin reappearing as soon as the remedy was suspended. The theory of its action is not stated.—*Am. Med. Digest*, March, 1885 ; *Brit. Med. Jour.*

ESERINE IN TETANUS.—G. H. Brandt ("Practitioner," October, 1884), reports a cure of traumatic tetanus in an adult from the administration of $\frac{1}{7}$ of a grain of eserine every hour.—*Pac. Med. and Surg. Jour.*, April, 1885.

OINTMENT OF LEAD NITRATE.—For old ulcers of the leg, Professor Bartholow recommends blistering the surface of the ulcer and the adjoining integument, then putting on a light poultice, and afterwards applying an ointment composed of: R. Plumbi nitratis, \mathfrak{z} i.; vaseline, \mathfrak{z} i.—*Med. Herald*.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Micro-Chemistry of Poisons; including their physiological, pathological and legal relations. With an Appendix on the detection and microscopic discrimination of blood. Adapted to the use of the medical jurist, physician and general chemist. By Theodore G. Wormley, M.D., etc., Professor of chemistry and toxicology in the Medical department of the University of Pennsylvania. With 96 illustrations upon steel. Second edition. Philadelphia: J. B. Lippincott Company, 1885. 8vo, pp. 784. Price, in cloth, \$7.50.

"This excellent work is a very valuable addition to the literature on the subject of poisons. Each page bears evidence of untiring research, and of a vast amount of labor." With these words we introduced the review of the first edition of this work, in 1867, and we repeat them now, as equally applicable to the new edition now before us. Even a superficial comparison with the former would show that the present volume has been thoroughly revised and brought up to the requirements of the present time. While its scope and design have not been altered, the additions are numerous, the more important being poisoning by potassium chlorate, post-mortem diffusion of arsenic, presence of arsenic in various articles, including glass, Dragendorff's method for the isolation of vegetable poisons, the ptomaines, jervine and gelsemium, with its two characteristic principles, gelsemic acid and gelsemine; finally, the properties, detection and discrimination of blood, which subject is illustrated by eight engravings on steel and a chromo-lithograph of blood spectra. In addition to these, a number of wood-cuts have been added, and ten steel engravings, showing the micro-chemical reactions of jervine and of gelsemium, the total number of illustrations on steel being 96, all of which have been engraved by Mrs. Wormley and her daughter, Mrs. J. Marshall. A table giving the behavior of 15 alkaloids to chemical reagents is also a valuable addition for the comparison of the reactions of these alkaloids and of the observable limits.

The importance of the subject treated, and the care and labor bestowed upon all the details, render the volume a standard work to which those interested may refer with the assurance of finding trustworthy information. The book is handsomely gotten up, and the proof-sheets have been very carefully read, the typographical errors being very few; on page 652 the name of Prof. Ladenburg has been twice rendered Landenburg.

Year-Book of Pharmacy; comprising Abstracts of papers relating to pharmacy, materia medica and chemistry contributed to British and foreign Journals from July 1, 1883, to June 30, 1884; with the Transactions of the British Pharmaceutical Conference at the 21st annual meeting, held at Hastings, August, 1884. London: J. & A. Churchill. 8vo, pp. 628.

Proceedings of the American Pharmaceutical Association at the thirty-second annual meeting, held at Milwaukee, Wis., August, 1884. Philadelphia: published by the American Pharmaceutical Association. 8vo, pp. 623.

The first one of these annual publications reached here early in February. The "Proceedings" have been printed, and will be distributed about the middle of May; with it will be bound the "General Index to vols.

xviii to xxx (1880 to 1882),” covering 174 pages. Accounts of the meetings of both Societies, with brief abstracts of the papers read, will be found in the October number, 1884, of this Journal. The “Year-Book” occupies 326 pages, in addition to which 28 pages give the titles of new publications relating to pharmaceutical subjects. The “Report on the Progress of Pharmacy” embraces 363 pages, or more than one-half of the second volume mentioned above. As usual, the “Year-Book” and the “Report” contain abstracts of most papers of pharmaceutical interest published during the year in Europe or America.

The Proceedings of the following State Pharmaceutical Associations for 1884 have not been previously noticed :

Illinois.—Fifth meeting held at Bloomington, on Sept. 30, 1884. 8vo, pp. 128. Next meeting in Chicago, on first Tuesday (1st day) of September next. T. H. Patterson, Secretary.

Iowa.—Fifth meeting held at Marshalltown, May 27, 1884. 8vo, pp. 160. With phototype of J. H. Harrison, of Davenport, who was President of the Association for 1883-84. Next meeting in Council Bluffs, May 12, 1885. Local Secretary, J. B. Atkins.

Michigan.—Second meeting held at Detroit, Sept. 9, 1884. 8vo, pp. 227. Next meeting in Detroit, Oct. 13, 1885. Local Secretary, A. W. Allen.

Review of the Drug trade of New York for the year 1884. Prepared by D. C. Robbins, Esq., for the 29th annual report of the Chamber of Commerce of the State of New York. 8vo, pp. 12.

During the fiscal year ending June 30, 1884, as compared with the preceding year, the importation of cinchona barks has decreased over one million pounds, while the quinine imported has increased over 200,000 ounces, the amounts being respectively 2,583,307 lbs., and 1,263,732 oz. The importation of opium during the same period has reached 264,746 lbs., an increase over the preceding year of 35,734 lbs. In consequence of the advance in the Customs rate from \$6 to \$10 per lb., only 1,066 lbs. of opium prepared for smoking was imported, but the importation of the same commodity during the preceding fiscal year was unusually large, having reached 298,153 lbs.

An Introduction to the Study of the compounds of Carbon, or Organic Chemistry. By Ira Remsen, Professor of Chemistry in the Johns Hopkins University. Boston: Ginn, Heath & Co., 1885. 12mo, pp. 364. Price, by mail, \$1.30.

As stated on the title-page, this book is intended for beginners, as an introduction to the study of the subject, and it therefore deals not so much with special facts, but rather with the fundamental principles underlying the compounds of this class. These principles are illustrated by special cases, and the general relations are discussed more fully than is usual in elementary works, and in a clear and attractive manner, well calculated for aiding the student in grasping the fundamental laws preparatory to the

study of special subjects or branches. More than eighty experiments are described, illustrating the methods used in preparing the principal classes of compounds, and the fundamental reactions involved in their transformations, thus showing the way to the proper study of this important branch of science.

The book deserves to be widely known among students of pharmacy, medicine and others whose aim is not merely a knowledge of a few isolated facts, but a sound foundation upon which correct knowledge of causes and effects may be based. The book is well printed; the proof-sheets have been carefully read; the equations explaining the reactions are numerous; graphic formulas are judiciously used to a limited extent; a limited number of illustrations showing the arrangement of apparatus in the performance of certain experiments have been added; and nothing of importance appears to have been omitted for accomplishing the objects had in view.

Cocaine hydrochloride as the name of the salt formed by cocaine with hydrochloric acid, and a discussion of the nomenclature of alkaloidal salts in general. New York: Druggists' Circular Press, 1885. 12mo, pp. 97. Price, 50 cents.

A reprint from the "Weekly Drug News" of a number of editorials and communications on the above subject.

The Medical Directory of Philadelphia, Pennsylvania, Delaware, and the Southern half of New Jersey. 1885. Philadelphia: P. Blakiston Son & Co. Pp. 397. Price, \$2.50; to subscribers, \$2.00.

This is a very complete and very carefully compiled directory, giving, in addition to the names and locations of medical practitioners, also those of pharmacists, druggists, chemists, dentists, veterinarians, and of other vocations more or less directly connected with or depending on the practice of medicine; also national, State and local associations, the Pennsylvania laws relating to medicine, pharmacy and dentistry, hospitals, dispensaries, homes, charitable organizations, etc. This varied information becomes readily accessible by a full table of contents and a complete index, and reference is greatly facilitated by the arrangement of material and types.

The Medical Directory of Chicago, including Cook Co., for 1884-85. Edited by Robert Tilly, M. D. Chicago: W. T. Keener. 12mo, pp. 179. Price \$1.25.

The scope of this work applying to Chicago and Cook Co., Ill., is similar to the preceding one, and it contains in a concise form such information as is frequently desired by physicians and pharmacists.

Official Register of Physicians and Midwives now in practice to whom certificates have been issued by the State Board of Health of Illinois, 1877-1884. Chicago: W. T. Keener. 8vo, pp. 324. Price \$1.50.

The register is arranged by counties in alphabetical order, reference to the names being had by three indexes, of physicians, midwives and towns. A directory of medical societies of Illinois, a list of revoked certificates for unprofessional and dishonorable conduct, the laws referring to the practice of medicine in Illinois and other matters are contained in this volume.

Index Medicus. Edited by John S. Billings, M.D., and Robert Fletcher, M.D. Published by George S. Davis, Detroit.

In former years we have repeatedly called attention to this valuable periodical, the publication of which was undertaken by the late Frederick Leypoldt, New York, and will henceforth be continued by the firm mentioned above. The general plan will remain unaltered, and the same regard as heretofore will be given to typographical accuracy and finish. We learn that thus far the enterprise has not been pecuniarily remunerative; but it is to be hoped that the support from the medical profession will be such as to make the publication self-sustaining; its importance cannot be over-estimated, containing as it does the subjects of all papers relating to medicine, appropriately classified, which are published throughout the civilized world, thus making an invaluable repository of all investigations and observations on the science and practice of medicine in its widest application.

The Elements of Botany; embracing organography, histology, vegetable physiology, systematic botany and economic botany. Arranged for school use or for independent study. Together with a complete glossary of botanical terms. By W. A. Kellerman, Ph.D., Professor of botany and zoology in the Kansas State Agricultural College, etc. Philadelphia: John E. Potter & Co. 12mo, pp. 360. Price, \$1.25.

As a work giving the outlines of botany, this publication is a very valuable one, which is admirably calculated to serve as an introduction to the more extended study of botany. Its arrangement is convenient, the descriptions, though necessarily brief, are clear and correct, the illustrations are characteristic, and the selection of the material shows good judgment and discrimination; the book will prove to be of value to students generally and to pharmaceutical students in particular.

The first part treats of organography, the morphological appearance of the different parts of plants. Then follows histology and physiology, in which the cell, the tissues and the conditions of growth are discussed. The third part is devoted to a brief exposition of systematic botany, followed by 80 pages on which an account is given of the more important plants and vegetable products used in medicine, as food and in the arts. The appendix contains valuable suggestions regarding the study of botany, the collection and preservation of plants, the use of the microscope, and a full glossary.

Plant Analysis; a classified list of the wild flowers of the Northern United States, with keys for analysis and identification; to which is added a complete glossary of botanical terms. By W. A. Kellerman, Ph.D., etc. Philadelphia: John E. Potter & Co. 12mo, pp. 253. Price, \$1.

This book is intended to aid the beginner in the identification and classification of the wild-growing North American phanerogamous plants growing east of the Mississippi, and from Kentucky northward, with the exception of the grasses, sedges, rushes, and those restricted to alpine or other limited localities. It is divided into two parts, the first of which is devoted to the morphology of the different parts arranged in the order of their importance for classification, viz., flower, fruit, leaf, stem and root, fol-

lowed by practical notes and suggestions, a glossary and a list of abbreviations of authors' names. The second part contains keys to the families, to the genera and to the species, followed by a systematically arranged list of the plants, numbering 1,707 species. The keys are arranged in quite a convenient manner, prominent and opposite characteristics having been selected for the purpose of analysis, and placed in juxtaposition, so as to become more thoroughly impressed on the mind.

Insomnia and other Disorders of Sleep. By Henry A. Lyman, A.M., M.D., Professor of Physiology and of diseases of the nervous system in Rush Medical College, etc. Chicago: W. T. Keener, 1885. Pp. 239. Price \$1.50.

The subject is treated of in seven chapters on the nature and cause of sleep, insomnia, remedies, treatment in particular diseases, dreams, somnambulism and artificial somnambulism or hypnotism, the last chapter closing with the consideration of the phenomena of so-called spiritualism, table-rapping, planchette-writing and metaphysical healing.

The reception of the following pamphlets is acknowledged :

Twenty-eighth Annual Report of the Council of the Pharmaceutical Society of Australasia, with which is incorporated the Pharmaceutical Society of Victoria, 1885, with list of members and honorary members. Melbourne. Pp. 16.

The Annual Report of the Pharmacy Board of Victoria. Melbourne, 1885.

Report on the Waters of the Hudson River, together with an analysis of the same, made to the Water Commissioners of the city of Albany. By C. F. Chandler, Ph.D. January, 1885. Pp. 35.

The Fifth-power. By J. B. Olcott. From Report of Secretary of Connecticut Board of Agriculture, 1885. Pp. 41.

Typhoid Fever and low water in Wells. By Henry B. Baker, M.D., Lansing, Mich. From the annual report of the Mich. State Board of Health, 1885. Pp. 26.

Report of Committee on School Hygiene, in Tennessee. By Dan. F. Wright, M.D., Clarksville. From the second report of the Tennessee State Board of Health, January, 1885. Pp. 51.

Yale College Observatory. Report for the year 1883-84. Horological and Thermometric bureaus.

Pennsylvania Hospital. Addresses delivered by Dr. Thos. G. Morton and John B. Garrett on the unveiling of West's picture Christ healing the sick. Eleventh mo. 10th, 1884. Pp. 30.

Sur le sulfo-carbol (acide ortho-cyphénylsulfureux), ses propriétés antifermentescibles et antiseptiques. Par M. F. Vigier, Pharmacien.

On sulphocarbolic acid, its antifermentative and antiseptic properties.

International Electrical Exhibition, 1884. Reports of Examiners of Sections xiv-xvi (batteries), xix (electric telegraphs), xxiv (electro-dental apparatus), xxvii (applications of electricity to warfare) and xxx (machinery and mechanical appliances).

The Oleates; further investigation into their nature and action. By John V. Shoemaker, A.M., M.D., etc. From the "British Medical Journal," October 14, 1884.

THE AMERICAN JOURNAL OF PHARMACY.

JUNE, 1885.

NOTE ON FROZEN GLYCERIN.¹

BY WALLACE PROCTER, PH.G.

Having occasion to empty a 50 lb. case of glycerin, during the early part of April, I found, to my surprise, that half the contents of the can was a mass which, on examination, seemed to possess a crystalline structure of great toughness and solidity. Suspecting an adulteration, tests for glucose, as the most probable, were first applied, but with a negative indication.

On applying to the party from whom the glycerin was purchased, I was informed that the whole of a large consignment, received from abroad, was more or less "frozen," as it is expressed technically. The statement was also made that, in the course of twenty years' extensive dealing in glycerin, only once previously had it been observed in this condition, and that some three years ago. It was of the nitro grade, such as is used in the manufacture of nitroglycerin, and almost without water. The article in question was not sold as the finest quality, but as a second grade, though comparing favorably in appearance and freedom from odor with any usually to be procured.

A further and more critical examination was made, with the following results—specific gravity of unfrozen portion, at 15.5°C., 1.235 to 1.237.

A portion, heated to 100°C. for ten minutes with an equal volume of sulphuric acid, gave but a very slight coloration; warmed with diluted sulphuric acid, an appreciable but very faint butyric odor was developed; when diluted with distilled water, test solution of silver nitrate produced no cloudiness after standing some hours. As before stated, the absence of sugars was also determined.

These results seemed to conclusively prove that the phenomenon was inherent with the glycerin itself, and not caused by any admixture or impurity.

¹ Read at the Pharmaceutical Meeting, held May 19th, 1885.

I was aware that two instances of the kind had been observed, and were commented on in a foot-note in the U. S. Dispensatory, 15th edition, p. 711; but, as I had never seen the substance in the solid state, my first impression was but natural. A specimen of the mass was removed from the can and preserved in a wide-mouthed bottle; this was placed in a refrigerator. It was brought to the college on April 21st, to be shown at the pharmaceutical meeting called for that day, but which, for lack of attendance, did not come to order. On that occasion more than half of the solid contents of the bottle melted, but a re-exposure to the temperature of an ordinary refrigerator has again caused crystallization. The crystalline structure is beautifully defined, as may be noted in the bottle presented, which I have packed in a freezing mixture to insure the preservation of that form.

The melting point, roughly ascertained, is between 21°C. to 26°C., or 70°F. to 80°F.

When completely melted and exposed to the temperature of a mixture of ice and salt for an hour, no signs of "freezing" were observed. Whether a longer period would cause recrystallization I am unable to say.

If the sp. gr. were higher, it would the more readily suggest that a state of almost complete dehydration was the most reasonable explanation of the phenomenon; but here we have .013, or .015 less than the officinal standard glycerin, which during my acquaintance with its properties has not been observed to "freeze." Since writing the above an accurate determination of the sp. gr. of the melted crystals reveals the fact that the portion which actually solidifies has really a high percentage of glycerin as indicated by the sp. gr. 1.2618 obtained by Prof. Trimble.

Aquæ Aromaticæ.—Mr. R., in a communication to the "Central-halle," recommends to dissolve 15 drops of the best quality of essential oil in 4 Gm. of alcohol (95 per cent.), and to use 1 drop of such an essence to 10 Gm. of distilled water. Medicated waters prepared with alcohol soon turn sour; therefore a large stock of them should never be kept on hand, but it is more economical and convenient to prepare them extemporaneously as stated. Mr. R. speaks very highly of the orange-flower water prepared with such an essence, and distilled from a glass retort.

NOTE ON GLYCERIN.¹

BY HENRY TRIMBLE.

In the April number of this JOURNAL, page 173, is an abstract on the use of glycerin vapor in throat troubles. The question has arisen, whether or not the vapor of glycerin would be given off when used as there recommended, by heating in a porcelain capsule, or whether the irritating decomposition products would be evolved. To determine this about 50 grams were heated in a capsule, with a thermometer dipping into the liquid. The temperature was allowed to rise very slowly with the following results: At 92° C. vapor could, with some difficulty, be seen rising; at 100° C. it was very perceptible; at 130° it was abundantly given off, rising as a dense white smoke. This vapor was almost odorless, without the slightest irritation, and tasted sweet when drawn into the mouth. This evolution of vapor continued without the liquid in the capsule becoming dark until a temperature of 234° C. was reached. At 264° there was a slight boiling, but the glycerin had so nearly all vaporized that the experiment was discontinued. The room was so filled with vapor that one could not distinguish objects clearly 10 feet away, yet none of those working there experienced any irritation or other difference except the sweetish taste on drawing air through the mouth. This experiment was repeated with the same result, and shows that when exposed to the air with a gradual application of heat glycerin will entirely vaporize with little or no decomposition. I am aware that a strong heat will cause it to boil and ignite in an open capsule.

Another experiment was tried by placing a large quantity of glycerin in a flask attached to a condenser. The flask was placed in a sand-bath and heat gradually applied. No change was observed, except a very small amount of vapor which condensed on the sides of the flask, until 174° C. was reached when ebullition began. A small amount of a disagreeable smelling liquid came over, which proved to be water and a small quantity of glycerin, with sufficient decomposition products to impart the odor. This moderate boiling continued with no further change, until at 274° C. the flame was removed, as it was evident the boiling would continue with greater decomposition as the temperature

¹ Contribution from Chemical Laboratory of Philadelphia College of Pharmacy.

increased. Only a small quantity of distillate was obtained. The glycerin used in these experiments had a specific gravity at 15° C. of 1.257, and otherwise came up to the requirements of the Pharmacopœia.

The statement has been made (*Gerlach*, "*Zeitschrift für analytische Chemie*," 24, 110) that absolute glycerin, specific gravity 1.2653, boils at 290° C., and that 95 per cent. glycerin, sp. gr. 1.2526, boils at 164° C. This practically corresponds to the experience above given, as very small differences in specific gravity make widely different boiling points.

In view of these facts it is evident that the boiling point given in the Pharmacopœia should be *not below 164° C.*, instead of 290° C. which is for absolute glycerin.

CHOCOLATE.

BY JAMES HERVY HAGENBUCH, PH. G.

Abstract from an Inaugural Essay.

There are several different ways of preparing chocolate. The best, and the one most generally used, is to take chocolate nibs (which are the seeds deprived of their outer covering) and grind them to a smooth paste in a mill with rollers, which are heated by passing steam into them by means of a pipe. To this paste the sugar and flavoring substances, principally vanilla or cinnamon, are added, and the whole reduced to a homogeneous mass, is moulded into cakes ready for the market. The heated rollers are used because they melt the fatty substance in the "nibs," and thus facilitate the making of the paste.

Unadulterated chocolate is compact, brittle, breaking with a smooth fracture, has a dark reddish brown color, and forms a perfectly homogeneous mass when worked into a paste. It should dissolve easily in the mouth, without leaving any gritty particles behind. The adulterations are very numerous, being composed principally of potato starch, flour, earthy matter, paraffin, tallow, lard, and other animal fats. Though nearly all the different kinds of chocolate contain starch it is nevertheless considered an adulterant. It makes a heavy and indigestible compound, because starch, unless boiled, is far from being digestible. Blythe says that it is considered an adulterant because it contains no nitrogenous principles, which are the main, and most valuable parts of the cacao, the principal ingredient of chocolate.

If this were the case, sugar also would be considered an adulterant, for it contains no nitrogen. There are certainly other reasons; one most likely is the solubility of sugar and insolubility of starch.

The chocolates are either sweet or bitter. The sweet chocolate is used mainly by the confectioners in making the different kinds of chocolate candies. When they use it for coating the chocolate drops it is sometimes adulterated with paraffin, which gives them their shiny appearance. The bitter chocolate is used principally as a nutritious drink; as a nutritive it stands much higher than either tea or coffee. Owing to the large quantity of fatty matter present in some brands, it is with all its nutritive powers apt to disagree with persons having very delicate stomachs; for this reason the English claim that the expression of the *oleum theobromæ* from the seeds, makes them better for the manufacture of a chocolate, which is more easily digested, and though the oil is extracted still contains the active principles.

From several Philadelphia manufacturers of chocolate, specimens were obtained for examination. These were first exhausted with ether to remove all the fatty ingredients. The residue was next treated with twenty per cent. alcohol, and allowed to stand twenty-four hours to remove the sugar. The remaining residue was boiled in water, the liquid filtered through charcoal, and the starch precipitated with fifty per cent. alcohol.

From Baker's chocolate was obtained the greatest amount of fatty matter, it containing 45.8 per cent. which fused at 36° C. (96° F.), this being near the fusing point of pure cacao butter. It contains twenty-eight per cent. of sugar, some starch, and 3.1 per cent. of ash.

C. and A.'s contained 35½ per cent. of fat, which fused at 38° C. (100° F.), this being about 5° F. higher than the melting point of cacao butter; sugar, starch, a substance insoluble in cold or hot water, or hydrochloric acid, and 2.75 per cent. of ash were found.

E.'s cocoa contained thirty-eight per cent. of fat which fused at 37° C. (98° F.), sugar nearly forty per cent., starch eighteen per cent., and an insoluble substance. The ash was 2.3 per cent.

W.'s plain commercial chocolate, contained 26.5 per cent. of fat, which fused at 36° C. (96° F.), sugar forty-five per cent. starch, and 2.2 per cent. ash.

W.'s sweet chocolate had but twelve per cent. of fat, and this fused at 38° C. (100° F.), nearly sixty per cent. of sugar, and 1.7 per cent. of ash.

A. & M.'s brand "A" contained twenty-six per cent. of fat, sugar, starch, and a quantity of coloring matter.

A. & M.'s powdered chocolate, contained fourteen per cent. of fatty matter, which fused at 39° C. (102° F.), sugar, and 4.4 per cent of ash.

ILlicium FLORIDANUM, ELLIS.

Natural order, Magnoliaceæ Illicicæ.

BY HENRY C. C. MAISCH, PH.G.

From an Inaugural Essay.

(Continued from page 228.)

CHEMICAL INVESTIGATION.

The analytical researches were made in the chemical laboratory of the Philadelphia College of Pharmacy. The parts of the plant were taken in No. 80 powder, and the estimations were made on the plant as obtained and not previously dried by artificial means.

Leaves.—The moisture of the leaves was determined to be 13.75 per cent. The same portion was used for estimating the ash which amounted to 5.033 per cent. The solubilities of the ash were as follows:

Soluble in water.....	1.600
Soluble in hydrochloric acid.....	2.500
Insoluble in either (silica).....	0.933
	———— 5.033 per cent.

The qualitative analysis resulted as follows: Acids, carbonic and phosphoric; Bases, potassium, sodium, aluminium, iron and calcium.

1. Petroleum extraction.—A portion of the powder was macerated with petroleum spirit (boiling point below 45°C.), the quantity being 1 gm. to 10 cc., which proportion was retained throughout the whole analysis. The percentage of residue remaining on spontaneous evaporation of a portion of the liquid was found to be 2.60, of which, on being heated, 0.23 was lost. This loss was estimated as volatile oil, because, on heating, the extract became entirely odorless. The reactions of this volatile oil are given under "Capsules," as the yield there was greater. The extract was not saponified by either aqueous or alcoholic solution of potassium hydrate. The latter solution was precipitated by the subsequent addition of water. The odorless residue amounted to 2.37 per cent.

2. Ether extraction.—The powder was next treated with the requisite quantity of ether. A part of the resulting liquid was evaporated and

the residue found to amount to 1.46 per cent., which lost nothing on heating to 110°C. The residue from another portion was treated with water, which acquired a bitter taste; the dissolved principle will be treated under the alcoholic maceration as this dissolved a larger quantity. The residue from the ethereal solution was completely soluble in strong alcohol, chloroform, benzol, aqueous and alcoholic potassium hydrate solution. The alcoholic solution was precipitated by distilled water and also by acidulated water. The extract was principally resin.

3. Absolute Alcohol maceration.—The residual powder from the above maceration was treated with the necessary quantity of absolute alcohol. The dried extract was equal to 5 per cent., which lost nothing on heating to 110°C. The air-dried residue was treated with water heated slightly and allowed to macerate for 24 hours. The water had assumed an acid reaction and a yellow color which was turned to a yellowish brown by ammonia water. The portion soluble in water amounted to 4.29 per cent. The aqueous solution was acidified and shaken with petroleum, benzol and chloroform. The liquid was afterward made alkaline and shaken with the same liquids, ether being used in addition. Most of the residues were crystalline.

In order to obtain a larger quantity of the crystals 75 grams of the drug were treated with 95 per cent. alcohol. This tincture was evaporated to a small bulk and precipitated with water. The filtrate obtained was shaken with petroleum, benzol and chloroform. The residue from the petroleum was entirely soluble in aqueous sodium hydrate solution, and after neutralization with hydrochloric acid a precipitate of a brownish color formed. The aqueous solution was then acidified and shaken with the liquids mentioned above. The residues from benzol and chloroform had a bitter taste, a neutral reaction and a crystalline structure. The same crystals were also found after the acidified aqueous liquid had been made alkaline and at that place the reactions are also given.

The precipitate obtained from the alcohol was boiled with dilute acid and this liquid shaken as above, and also after it was made alkaline. The residues consisted of a yellow resin neutral to test paper.

The undissolved precipitate from above was boiled with potassium hydrate solution and this shaken with the same liquids noticed above. The residue from the petroleum shaking consisted of a soft resinous mass and of colorless crystalline plates, the whole having the odor of orris root. The crystals were freed from adhering resin by a few

drops of alcohol. This liquid, like the dry resin, gave a green color with sulphuric, hydrochloric and nitric acids, the degree of intensity being in the order as enumerated, sulphuric acid giving the stronger color. Sodium hydrate dissolves but does not saponify the resin.

The crystals gave no precipitates with alkaloidal reagents, and did not produce any ammonia on heating with potassium hydrate. After boiling with dilute acid, they reduced alkaline copper solutions. The following are the reactions obtained for this principle: Sulphuric acid dissolved it in the cold without color, but on warming, the color became carmine-red. It gave no reaction with hydrochloric acid or nitric acid. Sulphuric acid and bichromate of potassium (Otto's test) gave in the cold a brownish yellow color, which on heating was changed to green. Sugar and sulphuric acid (Schneider's test) gave no color in the cold, but on warming the color is first light brown and rapidly darkens by the caramelizing of the sugar, while all through the reaction red spots are visible. Froehde's test (molybdate of ammonium and sulphuric acid) gave first a green color, and on heating slightly the color was rapidly changed to a dark blue. These reactions show the principle to be different from Eykman's sikimin, which does not reduce Fehling's test, even after boiling with dilute acid. From the reactions noted above, the crystals were regarded as those of a glucoside to which the bitter taste of the leaves is due. The crystals amounted to about 0.75 per cent.

The residues from benzol and chloroform shakings were of a dark green color and soluble in alcohol. The alcoholic solution was clouded by the addition of water, and further by a few drops of hydrochloric acid. The same solution gave with sulphuric acid a green liquid and a brown precipitate. The same reaction was obtained with hydrochloric and nitric acids; but, if heat be applied to the test with sulphuric acid, it becomes of a purplish color and ultimately chars; if the liquid with nitric acid is treated in the same manner, the precipitate becomes yellow and the green color is discharged; if to the hydrochloric acid test a few drops of nitric acid be added, the color is changed to red and ultimately to red-brown. If a quantity of the dry extract (resin) be heated in a glass tube open at both ends, it gives a reddish brown sublimate, inflammable vapors and a residue of charcoal. The shakings of the acidified alkaline solution gave nothing but resin.

4. Aqueous Extraction.—The powder from the above maceration

was treated with the required quantity of water which formed a thick mucilage; it was therefore diluted to allow of straining, and by evaporation brought to the first quantity when the liquid was thinner and permitted filtration. There was about 6.335 per cent. of precipitate present, which was regarded as albuminous matter. The liquid was then treated with twice its quantity of 95 per cent alcohol, which gave a precipitate amounting to 4.75 per cent. The precipitate from the filtrate by lead acetate was yellowish brown in color. This was separated, suspended in water and decomposed by hydrogen sulphide. The filtrate from this precipitation was evaporated to drive off hydrogen sulphide, this liquid then gave precipitates with barium and calcium hydrates, and a green color with ferric chloride; it was also precipitated by gelatin solution, by which means it was estimated. The tannin present amounted to 3.96 per cent.

5. Alkaline Extraction.—The powder was next treated with a 0.2 per cent. solution of sodium hydrate. The dissolved portion amounted to 9.9 per cent.

6. Acid Maceration.—The insoluble portion of the leaves was then treated with diluted 2 per cent. hydrochloric acid. The extract amounted to about 6 per cent.

The remaining, undissolved portion was bleached and weighed. It amounted to 42.6 per cent. This was regarded as lignin.

Stem.—The moisture and ash of the stem, as in the case of the leaves, were estimated from the same portion of the powder. The moisture amounted to 10.16 per cent. and the ash to 1.333 per cent., the small amount of ash being probably due to the large amount of sclerenchyma.

The solubilities of the ash are as follows:

Soluble in water. ....	.033
Soluble in hydrochloric acid.....	1.067
Insoluble in either.....	.233
	———— 1.333 per cent.

The qualitative analysis gave the following result: Acids, sulphuric and hydrochloric; Bases, magnesium, potassium, sodium, iron.

1. Petroleum maceration.—The powder was macerated with the necessary quantity of petroleum, the portion soluble herein amounted to 0.19 per cent. which lost nothing on heating to 110°C. The residue was soluble in ether, tasteless, unsaponifiable by either alcoholic or aqueous solution of potassium hydrate.

2. Ether extraction.—The powder was next treated with ether. The portion soluble in ether amounted to 0.23 per cent. The extract was soluble in alcohol, and in aqueous and alcoholic solution of sodium hydrate. Its reactions show it to be an acid resin.

3. Absolute alcohol maceration.—Absolute alcohol was the next solvent used for maceration. The soluble portion amounted to 1.9 per cent., of which 1.687 was soluble in water, .211 soluble in dilute ammonia, leaving .002 as insoluble in either. The extract was astringent but not bitter. Tannic acid was present to the amount of 0.54 per cent.

4. Aqueous extraction.—The powder remaining from the foregoing macerations was treated with the necessary quantity of water. The precipitate obtained by the addition of alcohol amounted to 1.8 per cent. There was an acid present, but on account of decomposition of the liquid it could not be estimated, although the reactions show it to be tannic acid.

5. Alkaline extraction.—The powder was next treated with a 0.2 per cent. solution of sodium hydrate. A part of this solution was neutralized with acetic acid and subsequently alcohol added; the resulting precipitate amounted to 0.9 per cent; the total extract being equal to 5 per cent.

6. Acid maceration.—The powder insoluble in the above extractions was next treated with diluted hydrochloric acid of about 2 per cent. strength. A portion of this liquid was neutralized with ammonia. The resulting precipitate amounted to 0.24 per cent., the total extract amounting to 1.88 per cent. and containing some iron. The remaining insoluble powder after bleaching weighed 64.005 per cent.

Root bark.—The moisture of the bark amounted to 13.865 per cent. and the ash to 5.7 per cent. The solubilities of the ash were as follows:

Soluble in water.....	.334
Soluble in hydrochloric acid.....	.2833
Insoluble in either (silica).....	.2533
	<hr/> 5.700 per cent.

The qualitative analysis resulted as follows: Acids: sulphuric and phosphoric; Bases: aluminium, calcium, magnesium, potassium, sodium.

1. Petroleum extraction.—The powder was extracted with petroleum as in the previous analyses. The soluble portion amounted to 2.60 per cent., of which 0.11 per cent. was volatile oil and the remainder 2.49 per cent. fat and a crystalline principle. The latter melts at 110°

C.; the same was also found in the capsules. The crystals were insoluble in alcohol and ether, but soluble in chloroform, and were neutral to test paper.

2. Ether maceration.—The powder was next treated with the necessary amount of ether. The extract amounted to 0.66 per cent., and consisted of resin.

3. Absolute alcohol treatment.—The powder was next treated with the requisite quantity of absolute alcohol. The soluble portion amounted to 12.2 per cent. The dry extract was soluble, as follows: 7.625 per cent. in water, 4.275 per cent. in dilute ammonia, and 0.3 per cent. insoluble in either. The aqueous solution contained tannin amounting to 5.4 per cent. The dilute ammonia dissolved the resin, which was of a ruby-red color and precipitable by neutralization with acetic acid.

4. Aqueous extraction.—The powder insoluble in the foregoing was treated with the necessary quantity of water. This mixture was diluted on account of the mucilage present and filtered. Alcohol gave a precipitate which amounted to 4 per cent., and on condensation alcohol precipitated 3 per cent. more. The total extract amounted to 8.96 per cent.

5. Maceration with diluted alkali.—The powder was next macerated with a 0.2 per cent. solution of sodium hydrate. The total extract amounted to 10.510 per cent., of which 9.605 per cent. was precipitated by alcohol and acetic acid to neutralization.

6. Treatment with diluted acid.—The powder insoluble in the foregoing extractions was treated with diluted 2 per cent. hydrochloric acid. The soluble portion amounted to 8 per cent. The remaining insoluble powder amounted to 42.625 per cent.

Capsules.—The moisture in the capsules amounted to 10.833 per cent. and the ash to 3.5 per cent. The solubilities of the ash were as follows:

Soluble in water.....	2.333
Soluble in hydrochloric acid.....	.467
Insoluble in either.....	.700

———— 3.500 per cent.

The qualitative analysis resulted as follows: Acids: sulphuric and phosphoric; Bases: copper, magnesium, iron, aluminium, potassium, sodium.

1. Petroleum treatment.—The powder was exhausted with petroleum. The soluble portion amounted to 1.25 per cent.; 0.5 per cent. was volatile oil and 0.75 per cent. was wax and a crystalline principle.

The crystals melt at 110°C . and are identical with those found in the root bark. The volatile oil is aromatic and pleasant, resembling in odor a mixture of bergamot and orange flower oils. The reactions are as follows: Strong sulphuric acid added to a chloroform solution gave a greenish color which changed to a purplish-red; ferric chloride and sulphuric acid gave a light green color, which gradually changed to brown and red brown.

2. Ether extraction.—The portion insoluble in petroleum spirit was treated with ether. The soluble portion amounted to 1.1 per cent., of which 0.2 were crystals and 0.9 resin. The extract is partly soluble in potassium hydrate and is precipitated on neutralization. The crystals have a bitter taste and the reactions obtained show it to be identical with the glucoside from the leaves.

3. Treatment with absolute alcohol.—The powder was next treated with absolute alcohol. The total extract amounted to 9.25 per cent., of which 6.125 per cent. was soluble in water. The glucoside was only found in the ethereal solution as it existed only in a minute quantity.

4. Aqueous maceration.—The powder insoluble in the foregoing was treated with the requisite quantity of water; in this case double the quantity was used, making the proportion 1:20. The precipitate by alcohol amounted to 2.48 per cent. The total extract was 7.48 per cent.

5. Alkaline extraction.—The powder was next treated with 0.2 per cent. solution of sodium hydrate. The portion soluble amounted to 4 per cent., of which 1 per cent. was precipitated by alcohol and acetic acid to neutralization.

6. Treatment with diluted acid.—The insoluble powder from the last treatment was treated with diluted 2 per cent. hydrochloric acid. The total extract amounted to 2.6 per cent., about 1 per cent. was precipitated by ammonia and consisted mostly of iron. The remaining insoluble powder after bleaching amounted to 62.3 per cent.

Seeds.—The moisture of the seeds amounted to 7 per cent. and the ash 2.222 per cent., the solubilities of which were as follows:

Soluble in water.....	334
Soluble in hydrochloric acid.....	1.444
Insoluble in either (silica).....	.444
————	2.222 per cent.

The qualitative analysis resulted as follows: Acids: sulphuric, hydrochloric and phosphoric; Bases: iron, aluminium, magnesium, potassium, sodium.

1. Petroleum maceration.—The powdered seeds were extracted with petroleum. A portion of the liquid on evaporation left a residue amounting to 35·8 per cent. and consisting of fixed oil. This is bland, without odor, has the specific gravity 0·903, and is saponified by alcoholic and aqueous potassium hydrate solution. Sulphuric acid has no action on it; nitrous acid converts it into elaidin.

2. Ether extraction.—The powder was next treated with ether. The dried extract amounted to 1·3 per cent. It was a soft yellowish resinous mass of an acid reaction.

3. The alcohol maceration was lost entirely through an accident.

4. Aqueous treatment.—The powder was treated next with water. The soluble portion amounted to 1 per cent., which was completely precipitated by alcohol.

5. Alkaline maceration.—The powder insoluble in the above was macerated with 0·2 per cent. solution of sodium hydrate. The total extract amounted to 15·9 per cent., of which 6 per cent. was precipitated by acetic acid and alcohol.

6. Acid extraction.—The powder was next treated with diluted 2 per cent. hydrochloric acid. The total extract amounted to 3 per cent.

The remaining insoluble powder was bleached and dried. It amounted to 31·4 per cent.

Recapitulation. Quantitative Results of Proximate Analysis.

	Leaves	Stem.	Root Bark.	Cap- sules.	Seeds.
Extracted by petroleum.....	2·600	·190	2·60	1·25	35·80
“ “ ether.....	1·460	·230	0·66	1·10	1·30
“ “ absolute alcohol.....	5·000	1·900	12·20	9·25	†
“ “ water.....	15·045	1·800*	8·90	5·000	1·00
“ “ diluted alkali.....	9·900	5·000	10·51	4·00	15·90
“ “ diluted acid.....	6·000	1·880	8·00	2·60	3·00
Residue (lignin).....	42·600	64·005	42·625	62·300	31·40
Loss.....	3·615	14·829	·640	3·667	4·60
Moisture.....	13·750	10·166	13·865	10·833	7·00
Total	100·000	100·000	100·000	100·000	100·00
ANAL.					
From air-dry part.....	5·033	1·333	5·700	3·500	2·222
From artificially dried.....	5·835	1·481	6·617	3·925	2·389

* Is not complete on account of loss.

† This was entirely lost.

PHARMACEUTICAL PREPARATIONS OF THE MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

Under "Preparaciones Farmacéuticas" the Mexican Pharmacopœia includes a number of animal and vegetable products which are rarely, if ever, made by the pharmacist, but are manufactured in industrial establishments and are met with in commerce as manufactured products. Among others, wine, vinegar, suet, lard, cacao butter, cocoanut oil, cod-liver oil, olive oil, and all other fats, as well as the various volatile oils have been placed in this class, while tar, oil of cade, empyreumatic animal oil, oil of amber, and similar articles are among the chemical products, "Productos químicos." Only the galenical preparations will be considered in the following abstracts.

These preparations are as a rule made by weight, and the formulas direct the ingredients in parts by weight, the total weight being usually 1,000 parts. The Spanish names have precedence in the pharmacopœia, and are followed by the French and English synonyms, and these by the Latin title. In the following only the Spanish and Latin names as recognized by this Pharmacopœia, will be given.

Aceite alcanforado, Oleum camphoratum.—Camphor 100, sesame oil 900.

Aceite de Cantáridas, Oleum Cantharidum.—Coarsely powdered cantharides 50, sesame oil 500; digest by means of a water-bath for six hours, express and filter.

Aceite de Cicuta, Oleum de foliis Conii maculati.—Fresh conium leaves 500, sesame oil 1,000; bruise the leaves, boil with the oil until the water has evaporated, digest at 80°C. for two hours, express and filter. The oils of belladonna, hyoscyamus, stramonium, solanum nigrum and tobacco are prepared in the same manner; instead of the fresh leaves, one-fourth the quantity of dried leaves may be used and moistened with a little water.

Aceite de estramonio compuesto, Balsamum tranquillans, Oleum Stramonii compositum.—Hyoscyamus, stramonium, solanum nigrum, and tobacco leaves, fresh of each 200 (or dried 50), belladonna leaves 50, sesame oil 5,000; bruise, boil and digest as above, express, decant and filter; then add 3 parts each of the volatile oils of lavender, rosemary, thyme, cedronella and spearmint; keep in a dark place.

Aceite fosforado, Oleum phosphoratum.—Phosphorus 2, sesame oil

100; fill a flask, stopper it, heat in a water-bath for 15 or 20 minutes, shake frequently, when cool decant from the phosphorus and preserve in small, well stoppered vials.

Acete de hígado de bacalao ferruginoso, Oleum jecoris aselli ferratum.—Ferrie benzoate 1, cod-liver oil 100; triturate the salt with a portion of the oil, put into a bottle, keep in a moderately warm place and shake well until a clear red-brown solution is obtained, rendering filtration unnecessary.

Acete de huevos, Oleum e vitellis Ovorum.—Yolk of egg is coagulated by heat, expressed between hot iron plates, and the oil filtered while hot and preserved in well-closed vessels.

Acete de manzanilla comun, Oleum de floribus Matricariæ Chamomillæ.—German chamomile flowers 100, sesame oil 1,000; digest in a water-bath for two hours, express and filter. In the same manner prepare the oils of St. John's wort, fenugreek and rose petals.

Acete de sándalo compuesto, Oleum Santali compositum.—Oil of St. John's wort 500, turpentine 120, sweet gum (liquidambar) 60; dissolve and mix with powdered dragon's blood 15, powdered red saunders 15 and oil of cloves 2.

Acido acetico aromatizado, Acidum aceticum aromaticum.—Glacial acetic acid 60, camphor 6, oil of lavender 0.05, oil of cloves 0.20, oil of cinnamon 0.10; dissolve.

Aguardiente alcanforado, Alcohol camphoratus communis.—Camphor 100, alcohol (60 per cent.) 3,900; dissolve and filter.

The following medicated waters are directed to be prepared by distillation, 1,000 parts of distillate being obtained from the quantities given in each case:

Agua de azahar, Hydrolatum florum Citri Aurantii, from fresh orange flowers 3,000.

Aqua de canela, Hydrolatum Cinnamomi, from Ceylon cinnamon 500.

Agua destilada de corteza de naranja amarga, Hydrolatum de cortice Citri vulgaris, from fresh bitter orange peel 150 and alcohol (80 per cent.) 81. The distilled waters of the peels of sweet orange, citron and lemon are prepared in the same manner.

Agua destilada de hojas de capulin, Hydrolatum foliorum Cerasi Capollin, from fresh leaves of Cerasus Capollin, *De Candl.*, 1,000. This water is used in the place of cherry-laurel and bitter almond water; 1,000 parts of it contain 0.5 parts of hydrocyanic acid.

Agua destilada de lechuga, Hydrolatum Lactuceæ, from 2,000 parts of flowering garden lettuce, deprived of the lower leaves.

Agua rosada, Hydrolatum Rosæ, from fresh rose petals 1,000.

Agua destilada de tilia, Hydrolatum Tiliæ, from dried linden flowers 1,000. In the same manner prepare distilled water from chamomile flowers, fennel, valerian and analogous drugs.

Agua destilada de yerbabuena, Hydrolatum Menthæ viridis, from fresh spearmint 4,000. Prepare in the same manner the water of eucalyptus leaves and of *Cedronella mexicana*.

The term *agua* is also applied to various solutions and mixtures, some of them containing alcohol.

Agua albuminosa, Aqua albuminosa.—White of two eggs, water 500 Gm.

Agua alcanforada, Aqua camphorata.—Macerate for two days powdered camphor 10 in distilled water 1,000; it is stated to contain 0.33 per cent. camphor in solution.

Agua de alquitran, Aqua picea.—Norway tar 5, pine sawdust 10; mix well and macerate for 24 hours with distilled or river water 1,000.

Agua articular, Tinctura de Nicotiana composita.—Tobacco 90, origanum, sage, rosemary, elder flowers, lavender, black pepper and mustard seed of each 60, euphorbium 30, castor 30, alcohol (60 per cent.) 3,000; bruise all the drugs except the mustard, macerate in the alcohol for 10 days, express and filter. Used as a stimulating embrocation.

Agua segunda de cal, Aqua calcica.

Agua de cal mercurial, Aqua phagedænica nigra.—Calomel 0.50, lime water 300; mix.

Agua carmelitana, Alcoholatum Cedronellæ mexicanæ compositum.—Fresh cedronella flowers 1,000, fresh lemon peel and bitter orange peel, each 120, nutmeg, cloves and coriander each 90, Ceylon cinnamon 60, alcohol (80 per cent.) 6,000; macerate for two days and distil from a water-bath. Dose as a stimulant 8 to 15 Gm.

Agua cefálica, Alcoholatum Rosmarini.—Fresh rosemary leaves 1,000, dry lavender flowers 500, alcohol (80 per cent.) 3,000; macerate for four days and distil off the spirit; from the residue by means of steam obtain 500 parts of aqueous distillate and mix the two liquids. Used externally.

Agua celeste, Collyrium ceruleum.—Sulphate of copper 1, ammonia water (20 per cent.) 5, water 625.

Agua de Colonia, Alcoholatum coloniense.—Volatile oils of limes and lemon each 30, of orange, cedronella, linaloe, lavender and rosemary each 15, of orange flowers and Ceylon cinnamon each 5, alcohol (84 per cent.) 3,500; mix, after four days distil, and to the distillate add essence of jessamin 30.

Agua del Dr. Sanchez, Collyrium cum sulfato zincico ex Sanchez.—Sulphate of zinc 2, powdered orrisroot 4, water 500; macerate for three days and filter.

Agua fagedénica roja, Aqua phagedænica flava.—Corrosive sublimate 0.40, lime water 120.

Agua fénica oficial, Aqua phenicata officinalis.—Crystallized phenol 20, water 1,000.

Agua hemostática de Pagliari, Aqua hæmostatica ex Pagliari.—Dissolve benzoin 20 in alcohol (90 per cent.) 50, and alum 100 in water 1,000; mix, heat to 60° C. with frequent agitation until the mixture is no longer turbid, and replace the water which may have evaporated. Its density is 6° B.

Agua sedativa de Raspail No. 1, Aqua ammoniac-camphorata ex Raspail.—Ammonia water (20 per cent.) 60, Raspail's spirit of camphor 10, sea salt 60, water 1,000. For No. 2 the ammonia water is increased to 80, and for No. 3 to 100 parts.

Agua de vegeto, Aqua cum subacetate plumbico ex Goulard.—Subacetate of lead 15, water 500, cologne water 30; mix.

Alcohol alcanforado, Alcohol camporatus.—Camphor 100, alcohol (90 per cent.) 900.

Alcohol alcanforado de Raspail, Alcohol camphoratus ex Raspail.—Camphor 100, alcohol (95 per cent.) 400.

For preparing distilled spirits, the drugs properly comminuted, are macerated in the alcohol for two or four days, after which time the liquid is distilled by means of a water-bath.

Alcoholato de canela, Alcoholatum corticis Cinnamomi.—Ceylon cinnamon 500, alcohol (80 per cent.), 4,000; distil off all the spirit. Orange and lemon spirits are made in the same manner from the fresh peels, using alcohol 3,000.

Alcoholato de contrayerba compuesto, Alcoholatum Dorsteniæ compositum.—Contrayerva 120, valerian 60, ginger 60, rosemary, sage, lavender and cloves of each 30, alcohol (80 per cent.) and water, each 3,000; distil 4,000 Gm.

Alcoholato de énula compuesto, Alcoholatum Foeniculi compositum.

—Fennel 120, anise, caraway, allspice, Ceylon cinnamon and laurel berries of each 30, rosemary, elecampane and ginger each 60, nutmeg, cloves and bitter orange peel each 5, alcohol (80 per cent.) 3,000, water 1,000; distil 3,000 Gm.

Alcoholato de Garús, Alcoholatum ex Garús.—Aloes 20, saffron 20, myrrh, Ceylon cinnamon, cloves and nutmeg, of each 10, alcohol (56 per cent.) 5,000; distil 2,500 Gm. This is used for preparing the *Elixir de Garús* by mixing of the above spirit 1,000, simple syrup 1,200 and double orange flower water 100 Gm.

Alcoholato de toronjil, Alcoholatum Cedronellæ mexicanæ.—Fresh cedronella leaves and flowers 1,000, alcohol (80 per cent.) 3,000; distil all the spirit; add to the residue fresh cedronella 500, and by means of steam obtain 500 Gm. of watery distillate and mix with the spirit.

Alcoholato de trementina compuesto, Alcoholatum Terebinthinæ compositum.—Common turpentine 500, white copal 180, myrrh 120, sweet gum (liquidambar) 120, laurel berries 100, galbanum, Ceylon cinnamon, cloves, nutmeg, ginger and origanum, of each 60, alcohol (80 per cent.) 3,500; distil 3,000 Gm. Used externally in rheumatic complaints.

Alcoholaturos, Alcoholatura, are tinctures prepared from fresh drugs, the plants being collected when the flowers begin to appear, bruised and macerated with an equal weight of 90 per cent. alcohol. Such tinctures are prepared from aconite leaves, aconite root, arnica flowers, hyoscyamus, belladonna, colchicum tubers and flowers, digitalis, stramonium, tobacco, toxicodendron and from the flowers of *Magnolia mexicana*.

Algodon absorbente *Gossypium absorvens*.—Prepared by a process similar to that recommended by Mr. F. L. Sloenm ("Am. Jour. Phar.," 1881, p. 53).

Algodon yodado, *Gossypium iodatum*.—25 Gm. of carded cotton are mixed as intimately as possible with 2 Gm. of finely powdered iodine; the mixture is introduced into a glass stoppered bottle, which is heated for several minutes in water to expel the air, then firmly closed, and heated to about 100° C for at least two hours. After cooling the cotton is preserved in well stoppered bottles.

Apocema blanca de Sydenham, Apozema alba ex Sydenham.—Precipitated calcium phosphate 20, powdered white bread crumb 40, white gum, 40; mix, boil with water, stirring continually, and when the mixture has been reduced to two liters, pass through loose cotton

and add syrup of gum, 120 Gm. Used as an anodyne and absorbent, 60 to 290 Gm., or more being taken during a day.

Apocema de cuso, Apozema de Brayera anthelmintica.—Powdered koosso 10, water 200; macerate for 12 hours, boil until reduced to one-half and dispense without straining.

Apocema sudorifica, Apozema sudatorium.—Guaiaac wood 60, sarsaparilla 30; boil for one hour with sufficient water for making 1,000 parts of decoction, macerate for two hours with sassafras 10 and liquorice root 20, then strain and decant. To be taken in divided doses during a day.

Arrope de mora, Rob mororum.—Evaporate slightly fermented juice of mulberries to the consistency of thick honey. Rohob of elderberries is prepared in the same manner.

Azucar naranjada purgante, Oleosaccharuretum Aurantii purgativum.—Powdered jalap 60, soluble tartar (potassium boro-tartrate) 15, sugar 440, oil of orange 4. Dose as a purgative 8 to 15 Gm.

Bálsamo anodino, Tinctura cum Opio et Sapone camphorata.—Opium 60, soap 120, camphor 90, saffron 30, alcohol (80 per cent.) 3,000; macerate for ten days. Used externally in rheumatism and neuralgia.

Bálsamo católico, Tinctura balsamica.—Angelica 10, flowering tops of St. John's wort 20, alcohol (80 per cent.) 720; macerate for eight days, express, strain and add myrrh 10, frankincense 10; again macerate for eight days and add tolu balsam 60, benzoin 60, and Cape aloes 10; macerate as before and filter. Used as a topical application for indolent and troublesome ulcers.

Bálsamo de Gonzalez, Linimentum anodynum.—Stramonium oil (oleoinfusion) 250, anodyne balsam 25, ammonia water (20 per cent.) 15. Used in muscular pains of the breast and back.

Bálsamo nerval, Balsamum nervale, Pomatum nervinum.—Camphor 3, Tolu balsam 6; reduce to a fine powder, add gradually with trituration a mixture of beef marrow 70, expressed oil of nutmeg 90, and sesame oil 20, and incorporate with it oil of rosemary 6, and oil of cloves 3. Used as an anodyne in rheumatism.

Bálsamo Opodeldoc concreto, Linimentum Opodeldoch concretum.—Formula of the former French Codex.

Bálsamo Opodeldoc líquido, Linimentum Opodeldoch liquidum.—Equivalent to our soap liniment, but contains about 2.6 per cent. of ammonia water.

GLEANINGS FROM FOREIGN JOURNALS.

BY J. ROBERT MOECHEL.

Stable Solution of Salicylate of Sodium.—G. M. Markovich recommends adding gradually 60 Gm. of sodium bicarbonate to 100 Gm. salicylic acid, and 225 Gm. water, contained in a flask; when effervescence ceases, warm; then pass through a previously washed filter, and add 1,000 Gm. of distilled water. This gives a solution containing 10 per cent. of the salt.—*Phar. Post*, 1885, p. 273.

For removing iron mould a weak solution of zinc chloride is recommended as being better than oxalic acid; afterwards wash with cold water.—*Ph. Post*, 1885, p. 368.

Poudre Refulgente, Polishing Powder.—Mix 93 magnesia with 7 parts red oxide of iron.—*Rundsch. Leitn.*, 1885, No. 7.

Cologne Water, I.—10 oil of bergamot, 5 oil of lemon, 1 oil of lavender (best), 5 oil of rosemary (rectified), 1 oil of cloves, 1 oil of neroli (best), 0.2 oil of ylang-ylang, 1 acetic ether, 1 acid acetic, 825 alcohol, 150 distilled water. Warm this mixture to 70° or 75°C, then keep in a cool place for two days, and filter. Heating to such a temperature improves a Cologne water considerably, and makes it resemble the distilled perfume, surpassing the simple mixture of the ingredients. The true Cologne waters are either acid or alkaline in character. No. 1 belongs to the former class; those of the latter class contain a little ammonia; but it should be remembered that the oils of lavender and rosemary acquire a strong unpleasant odor in presence of free alkali.

Cologne Water, II.—10 oil of bergamot, 5 oil of lemon, 2 oil of rosemary, 1 oil of neroli, 0.5 oil of lavender, 0.2 ammonia water, 885 alcohol, 100 distilled water.

Cologne Water, III, for bathing.—2 oil of citronella, 2 oil of lemon, 5 oil of bergamot, 5 oil of rosemary, 2 oil of sassafras, 1 oil of cloves 1 oil of wintergreen, 10 acetic ether, 800 alcohol, 200 distilled water. Prepare as above. For distilling, add one-half more of water, and distil very slowly, avoiding unnecessary heat.

Fly Water.—Mix when needed, and dispense without filtering, 200 syrup of quassia, 50 alcohol and 750 water. It is used by moistening with the mixture a cloth or filtering paper on a plate.

Syrupus Quassie.—Macerate, during 24 hours, 1,000 parts of quas-

sia wood with 5,000 parts of water, then boil for $\frac{1}{2}$ hour. Set aside for 24 hours, and press. Mix the liquid with 150 parts of molasses, and evaporate to 200 parts. A weaker decoction of quassia does not kill the flies.

Tincture of iodine is proposed as a new blow-pipe reagent by Wheeler and Ludeking, who find it to take the place of hydriodic acid, recommended by E. Haanel. In place of the ordinarily used charcoal they recommend discs made of plaster of Paris. The substance to be examined is placed on one end of the disc, moistened with the tincture, and then heated with the blue flame; the volatilized iodides settle on the cooler part of the disc. The metals are distinguished by the following colors: arsenic, orange-red; lead, chrome yellow; tin, orange-brown; silver, pale grayish yellow when cold, and light yellow when hot; antimony, orange-red; mercury, yellow, soon changing to scarlet; selenium, reddish brown; bismuth, chocolate-brown, with red border on the side nearest the substance examined; cobalt, greenish brown, with green border (the brownish hue soon changes to light green, especially when blown upon); molybdenum, deep ultramarine blue near the heated spot; tungsten, pale greenish yellow near the heated spot; copper, white; cadmium, white, turning bright golden yellow when vapor of sulphide of ammonium is blown over it; zinc, white, disappearing soon.

If a drop of a solution of ammonia be added to, or if ammoniacal vapor be blown upon the velvety chocolate-brown mass produced by bismuth, the color changes from brown to bright red.

Many of the colors soon vanish. By this method tin and zinc can be distinguished by means of the blow-pipe. The reaction of molybdenum is distinct and characteristic.—*Chemiker Zeitung*.

Terpin has been recommended as an excellent expectorant in bronchitis, in doses from 0.20 to 0.40 Gm.

Fournie prepares terpin as follows: a mixture of 4 liters of rectified oil of turpentine, 3 liters of alcohol (80°), and 1 liter of nitric acid, is placed in large shallow porcelain or glass vessels. The crystals which separate are collected, dried between folds of filtering paper, and again dissolved in 95 per cent. alcohol which has been made alkaline so as to neutralize any adhering HNO_3 ; the solution is set aside in a cool place to crystallize. The yield is about 12 per cent. of the turpentine used.—*Lyon Méd.*; *Ph. Centralhalle*, No. 17.

NOTE ON THE ALLEGED DECOMPOSITION OF QUININE
IN CONTACT WITH LIME.¹

BY F. W. PASSMORE.

In a recent communication to the "*Journal de Pharmacie*,"² M. Masse expresses an opinion that the lime used in the ordinary processes of cinchona bark analysis exercises an injurious influence upon the yield of alkaloid, especially at the temperature of the water-bath. This opinion he considers to have been confirmed by the results of some experiments made directly upon quinine sulphate, of which he describes the following:

One gram of the crystalline salt, containing 12 per cent. of water, and therefore representing 0.88 gram of anhydrous sulphate, was dissolved in 50 cc. of water, acidulated with 1 cc. of hydrochloric acid. The solution was divided into two equal parts, and 10 grams of lime having been added to each portion both were evaporated to dryness, one upon a water-bath at a temperature of 91° C., the other in the cold under a bell-glass connected with a water-pump. The dry mixture which had been submitted to the temperature of the water-bath, when extracted with chloroform, gave a solution which, according to M. Masse, yielded a residue of quinine equal to only 0.389 gram of sulphate of quinine dried at 100° C. The other mixture, which was air-dried, when treated in the same manner yielded a residue equal to 0.430 gram of dry sulphate of quinine. As the theoretical quantity that should have been obtained in each case was 0.440 gram, there was a deficiency in the former case of 0.051 gram and in the latter of 0.010 gram of sulphate of quinine, which M. Masse attributes to the action of the lime.

If this statement could be substantiated it would be of considerable importance, as pointing to a loss of upwards of 11½ per cent. of alkaloid, and therefore constituting a source of serious error in the analysis of bark by methods ordinarily followed. In order therefore to test its accuracy, M. Masse's experiment was repeated. 0.5 gram of pure quinine sulphate, containing 5.3 per cent. of water and equivalent to

¹ Read at an Evening Meeting of the "Pharmaceutical Society" of Great Britain, April 1, 1885. Reprint from "*Pharm. Jour. and Trans.*," April 11, 1885, p. 829, communicated by the author.

² "*Journal de Pharmacie et de Chimie*," March 1, 1885, p. 260.

0.411 gram of alkaloid, was dissolved in 25 cc. of a 2 per cent. solution of hydrochloric acid; to this solution 10 grams of lime was added and the whole was dried at the temperature of the water-bath. The residue was finely powdered, introduced into a small glass percolator and the alkaloid extracted with chloroform. After complete exhaustion of the mixture the chloroform solution was carefully evaporated to dryness. The residue gave a weight of 0.409 gram of quinine alkaloid, or a deficit of two milligrams, which slight loss may be considered to be due to experimental error. In a subsequent experiment ether was employed in preference to chloroform as an extracting agent, as being less difficult of manipulation. The ether residue obtained was, to avoid impurities, redissolved in a slight excess of acid, and the alkaloid precipitated with ammonia and extracted with ether. This second ether solution upon evaporation left a residue of quinine alkaloid weighing 0.409 gram, or a deficit of 0.002 gram upon the 0.411 gram of alkaloid required by theory. This loss also may be considered due to experimental error, and both results are totally at variance with those obtained by M. Masse.

NOTE.—The results obtained by Mr. J. F. C. Jungk and by Professor R. Fresenius, in investigations made for an entirely different purpose (see "Am. Jour. Phar.," 1883, p. 434, 435) agree completely with those of Mr. Passmore.—EDITOR AM. JOUR. PHAR.

Cassia Absus, Lin.—Attention has recently been called again to the seeds of this plant which have long been used in the East for granular conjunctiva under the name of *chichem* or *schimseh*, and occasionally in Europe as *semen cismae*. The plant is an annual, indigenous to the East Indies and westward to Central Africa; the rather narrow glandular-pubescent legume contains 5 or 6 seeds, which resemble flaxseed, are flattish-ovate, glossy, brownish black, and have a somewhat aromatic odor and a mucilaginous disagreeable and bitter taste. J. J. Virey, in "Jour. de Phar.," May, 1823, described the application as follows: The seeds are well washed, then dried, finely powdered and mixed with an equal quantity of sugar; a small portion of this powder is dropped or blown into the diseased eye, which is then closed. The powder is of rapid action and irritating, and should not be used in the inflammatory stage of the disease; according to Frank its activity is increased by the addition of turmeric.

J. M. M.

DETECTION OF PHENOL IN CREASOTE.¹

BY PETER MACÉWAN.

In the "Chemical News," of May 2, 1884, there appeared the following note among the weekly "Chemical Notices from Foreign Sources," the source in this instance being "Zeitschrift für analytische Chemie: "

"*A Sensitive Reaction of Phenol* (J. F. Eykman).—A very dilute solution of phenol mixed with a few drops of nitrous ether, and the same volume of undiluted sulphuric acid, takes a red color. If the acid is allowed to run down the side of the glass so as to form a layer below the phenol solution, there appears a narrow red band where the liquids meet. This reaction indicates one in two millions."

On trying the test with a 5 per cent. solution of pure nitrous ether, and 1 per cent. and 1 per mille solutions of phenol, I obtained a triple ring, the intermedial stratum being brown, the lower a bright emerald green, and the upper pink. This not being satisfactory I referred to the "foreign source" and found that Eykman's paper had appeared in *New Remedies* and that *spirit of nitrous ether* was to be used in the test. With the spirit the emerald green color is not produced; the ring is at first brown with a red shade, but after standing for a short time the brown color disappears, leaving a fine pink stratum, and the strong acid has also a pink shade. On mixing the two liquids an opaque solution of a red shade (approaching magenta) is produced. The pure nitrous ether solution is quite clear and of a darker red color. The red color is due to reaction between phenol-sulphonic acid and the aldehyde contained in the sweet spirit of nitre.¹ The reaction as a mere test-tube experiment is pretty and interesting, particularly when a solution of pure nitrous ether is used, the immediate bright green color, and the gradual development of the red owing to the slow formation of aldehyde, are very interesting. Apart from this it struck me that the reaction might be practically useful in the detection of phenol in creasote, and I put the matter on trial.

An aqueous solution of creasote (1 in 500) on the addition of spirit of nitrous ether becomes cloudy and colored (phenol solution remains transparent and colorless), and when the sulphuric acid is added a

¹ Read at a meeting of the Edinburgh Chemists' Assistants and Apprentices' Association, January, 28.

² See paper by Mr. Dunstan, "Pharm. Journ.," [3], xiv, 887.

dark brown ring is formed between the layers. After cooling, the layers are mixed, and a brown solution with a brown froth is formed.

The following results were also obtained:

Creasote containing 10 per cent. of phenol. Dark brown ring, brown above, acid acquired pink tinge. On mixing: dark brown solution, and brown froth with red shade.

Creasote containing 20 per cent. phenol. Dark brown ring, brown above, acid acquired pink color. On mixing: red-brown solution and froth of red shade.

Creasote and phenol, equal parts. Red-brown ring, brown above and pink below. On mixing: pink-brown solution and pink froth. (This mixture gives results which nearly approach to those with pure phenol.)

If the solutions of pure creasote and those containing 10 and 20 per cent. of the adulterant be allowed to stand for half an hour or longer after mixing, again shaken and allowed to rest for a few minutes, the pure creasote froth is found to be white, while the others are distinctly red tinted.

From these results I consider that the application of Eykman's test to the detection of phenol in creasote is practicable; the reagents required are common things, and the application of the test quite easy. Although I have made parallel experiments with solution of pure nitrous ether, the results obtained were not much different from those with spirit of nitrous ether. The strength of the creasote solution should be about 1 in 500—a single drop dissolved in an ounce of water will serve. In applying the test, five drops of spt. aether. nit. are first placed in a test-tube (5 inches by $\frac{3}{4}$ inch diameter is the best size to permit shaking), then a drachm of the creasote solution, and, lastly, the same volume of strong sulphuric acid carefully poured down the side of the tube. There are first to be noted the color of the ring and any change produced in the acid; if it be pink, phenol is present. Then after the contents of the tube are quite cold the layers should be mixed and the color of the froth noted, which will corroborate the first observation. Further, if the contents of the tube remain undisturbed until the flocculence rises to the surface, the clear liquid in the case of pure creasote is of a pale brown color, but when phenol is present to the extent of 10 or 20 per cent. it is a dark red or reddish brown.—*Phar. Jour. and Trans.*, March 14, 1885, p. 754.

A TECHNICAL POINT IN THE MANUFACTURE OF
CERTAIN AERATED BEVERAGES.¹

BY W. A. H. NAYLOR.

A short time ago a manufacturer of aerated beverages brought to me a bottle each of ginger ale and ginger beer that he had recently made, in which neither aroma nor pungency could be detected. He was quite unable to account for the rapid disappearance of those characteristic properties, which he affirmed the syrupy essence possessed to a high degree before aeration, and he desired from me an explanation.

As no clue to the cause of this remarkable disappearance was obtained from the answers he supplied to numerous questions put to him regarding the purity of the materials he had used in the production of the drinks, it was deemed advisable to subject the two samples to a general examination.

As a preliminary step, the carbonic acid was drawn off, collected and examined, the result being that the gas was found to be mixed with an appreciable quantity of air. The further discovery was made that both samples were contaminated with copper, a circumstance which sufficiently explained the metallic taste that characterized them. But in these facts there did not appear more than a show of reason for regarding them as sources of the evil which formed the subject of complaint. Accordingly the machinery was overhauled and the necessary repairs were executed. In proof of the fact that the mechanical defects were remedied, it may be mentioned that subsequent "charges," after bottling, showed no admixture of gas with air, and no metallic contamination. The complete result, however, was not obtained, for on opening one of the bottles four hours afterwards it became evident from the absence of pungency that the old grievance still existed. The next step consisted in testing the respective materials, solid and liquid, which played any part in the manufacture of the ginger beverages. These included citric acid, sugar, ginger essence, water, and calcium carbonate from which the gas was generated. All were found to be unexceptional as to quality. There was yet one more chemical to be examined, viz., the oil of vitriol. The chief feature that attracted attention in regard to the acid was the unpleasant smell it emitted,

¹ Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, March 4, 1885.

recalling nitrous acid. This suspicion as to the presence of nitro-compounds was confirmed on the application of the well-known iron test. A given volume of the acid was next treated with an excess of pure sulphuric acid and metallic mercury, and the volume of nitric oxide evolved was measured. It gave gas corresponding to the following amounts of nitrogen: One hundred pints of the acid yielded four and a half pints of nitrogen, equivalent weight for weight to .003 per cent. of nitrogen. Beyond traces of iron no other impurity was detected.

At this stage the following experiments were instituted. Into a soda-water bottle were put suitable quantities of the ginger essence, syrup and calcium carbonate, and water to nearly fill it. Then sufficient of the contaminated acid was added to decompose the lime, and the contents of the bottle were immediately secured by a cork wired down. Repetition experiments were made, in which a portion of the ginger essence was replaced by capsicine and gingerine, and others in which a pure acid was substituted for the impure oil of vitriol. The bottles were opened at varying intervals, when the following observations were made. Those in which the impure acid had been used showed a marked decrease in pungency at the end of two hours; at the end of four hours the pungency was faint; at the end of six hours it had completely disappeared. The ginger essence, gingerine and capsicine had been affected apparently to the same degree. Those in which the pure acid had been used had retained their pungency apparently in its entirety.

These results, which were in perfect accord with those which were obtained at the factory, left little doubt that the cause of mischief was attributable to the nitro-compounds in the oil of vitriol used for generating the carbonic acid gas.

This conclusion received the clearest verification at the hands of the manufacturer the instant he used an acid that was free from smell and that did not respond to the iron test.

Beyond this point the inquiry was not pushed, and, therefore, it is not possible to predict with certainty the precise change which here takes place. Dr. Thresh, in his investigations on the pungent principles of plants, has demonstrated their ready destructibility under the influence of oxidizing agents. And it is not improbable that the effect produced by small amounts of nitro-compounds, acting under great pressure, on the active principles of ginger and capsicum is similar to

that which results from the use of strong oxygenated solutions acting at ordinary pressures. If this were so, the decomposition would give rise among other products to a fatty acid of the acetic series.

In offering this note for publication I desire it to be understood that its one object is to supply an explanation—hitherto I believe unknown—of an important fact, and to caution makers of aerated beverages against the use of an acid impregnated with the oxides of nitrogen.—*Phar. Jour. and Trans.*, March 4, 1885, p. 731.

AN IMPURITY IN DISTILLED WATER.¹

BY T. P. BLUNT, F. C. S.

In the late autumn of last year an anomaly was observed in the indications of Tidy's permanganate test for water. It was found that the amount of iodine set free from potassium iodide in the blank experiment with distilled water was very much in excess of what was to be expected, and the amount of hyposulphite solution used in destroying it varied in successive determinations within very wide limits. It was at first suspected that the iodide used contained iodate, but this did not prove to be the case. Then one by one the different solutions were made afresh until all had been changed. Still the perplexing anomaly continued; 75, 80, even 120 measures of hyposulphite solution were used up instead of the calculated 54 or 56. Thus by a process of exhaustive elimination I was driven back on the distilled water as the source of the trouble. I tested it by adding some quantity to acidified starch and iodide solution, and at once obtained a strong blue coloration. This reaction pointed to the presence of nitrous acid, and though I was not in a position to apply the direct metaphenylenediamine test there can be no doubt that the anomalous results observed were to be attributed to that body. The dilute permanganate for the blank experiment is prepared at the time by mixing a measured bulk of a stronger solution with distilled water, and no doubt the great difference in the quantities of iodine liberated was due to accidental variations of the time intervening between the mixture and the addition of potassium iodide, the mutually destructive reaction between permanganate of potassium and nitrous acid occupying some little time.

¹ Read at an Evening Meeting of the "Pharmaceutical Society" of Great Britain, April 1, 1885.

Together with the nitrous acid, ammonia was found in unusual quantity, and the acid was probably present in part at least in the form of ammonium nitrite.

It will be noticed that this occurred in the late autumn, which agrees with the recorded fact that the organic impurities in water increase on the approach of the winter months. Nitrous acid in water is usually ascribed to the reducing action of a micro-organism on nitrates, themselves produced from ammonia or combined organic nitrogen by another organism of opposite chemical function, as recently shown by Warrington, and in the present case this is no doubt the true account of the matter. But nitrites are by no means invariably due to organisms; it is well known that in Williams's process for determining nitrates with the copper-zinc couple, and in other similar methods where zinc is used for reducing them, the appearance of ammonia is preceded by that of nitrites, and it has come under my observation that where a water containing nitrates is passed through some length of "galvanized" iron piping, nitrites are formed in some quantity. Indeed, wherever nitrites are detected in a water it is always safer to test for zinc, which may be done in a moment with potassium ferrocyanide and a few drops of hydrochloric acid.

It is clear that nitrous acid is a very undesirable constituent of distilled water from a pharmaceutical point of view, and I am now in the habit of adding to my still-charge a slight excess both of sulphuric acid and of potassium permanganate. I thus succeed in destroying nitrites and keeping back ammonia, and am able to provide for myself and supply to my colleagues in the town a distilled water of exceptional purity, giving no reaction whatever either with Nessler's test or starch and iodide solution.--*Pharm. Jour. and Trans.*, April 11, 1885, p. 829.

Sedum acre, *Lin.*, nat. ord. Crassulaceæ, is recommended by Dr. Louis Duval, of Madrid, as a remedy for diphtheria, a decoction in beer being made of which a wineglassful is taken every hour. After several doses copious vomiting is produced, removing the diphtheritic membranes.

This is the *mossy stonecrop* of our gardens and naturalized in dry and rocky places in the United States. It formerly enjoyed considerable reputation as a remedy in scurvy, dropsy, epilepsy, and externally in ulcers and various skin diseases.

J. M. M.

SPURIOUS CUBEBS.

BY E. M. HOLMES, F. L. S.,

Curator of the Museum of the Pharmaceutical Society.

My attention has recently been directed again to the spurious cubebs which were offered for sale in the London market last year, by a paragraph in the "Lancet" (May 2, p. 829), from the pen of Dr. Buxton Shillitoe, in which he states that a patient came to him, who had been taking cubeb powder, and complained that it made him feverish, with sickness and purging. The patient had previously taken cubeb powder for a week without its disagreeing with him, and then had to buy some more. The new sample had a more acrid and unpleasant taste, and gave rise to nausea, followed by diarrhoea, etc. He persevered with it for three days, when he became so ill that he could not go to business.

Feeling sure that either the spurious cubebs (*Piper crassipes*?), which Mr. W. Kirkby kindly examined microscopically at my request ("Phar. Jour.," Feb. 14, p. 653), or the berries of *Daphnidium Cubeba*, which have still more recently been offered as cubebs, had been used, either pure or mixed with true cubebs, I wrote to Dr. Shillitoe, who kindly furnished me with a specimen of the cubebs which caused the unpleasant symptoms above described.

The distinctions between the true and spurious cubebs, given in Mr. Kirkby's paper, being available only for detecting the entire fruit, and not for the examination of the powder if mixed with that of true cubebs, it seemed desirable to again examine the drug in the interests of public safety, in the hope of finding out some practical test that could be easily and quickly applied so as to enable chemists who might unwittingly have received the adulterated article to detect its character. I therefore made a decoction of the true drug, of the *Piper crassipes* and of the *Daphnidium Cubeba*, and of the adulterated cubebs forwarded by Dr. Shillitoe, and applied several reagents, with the following results.

Iodine solution gave a bright indigo-blue coloration with the genuine cubebs, a dull purplish hue with *P. crassipes*, no change of color with *Daphnidium Cubeba*, and a dull purplish blue with the spurious cubebs, indicating an admixture of a little genuine cubebs with *P. crassipes*, very different to the very distinct blue tint of the genuine drug.

Solutions of bichloride of mercury, subacetate of lead, perchloride of iron, and nitric acid gave no useful indications.

On crushing a little of the genuine cubebs on a porcelain slab with concentrated sulphuric acid a deep crimson color with a distinct earmine tint in it is quickly developed. *P. crassipes* gives a reddish brown color, *Daphnidium Cubeba* a yellowish brown hue, and the adulterated cubebs a crimson-brown tint. Under the microscope the small angular starch of both the false and genuine cubebs is easily recognized, but *D. Cubeba* does not show any starch granules.

On repeating the experiments, I found that the distinct pure blue tint given by iodine to a decoction of genuine cubebs could be distinguished without difficulty from the dull purple tint (like diluted ink) of the spurious cubebs, even when the liquid was diluted, and that the peculiar earmine hue of the genuine was easily recognizable in the genuine article, especially at the edge of the drop of acid, but not in the adulterated cubebs.

I hasten, therefore, to point out these two tests, in the hope that they may serve to prevent this spurious cubebs from being further sold to the public. In view of the difficulty that exists in preventing spurious drugs, especially in the form of powder, entering into commerce, it may be interesting to state the facts concerning the spurious cubebs, so far as I am acquainted with them.

On March 21, 1884, I received a specimen of spurious cubebs from Mr. J. Hartford, of New York, who stated: "I picked up, in the early part of the week, a sample of cubebs out of a lot of two bags offered at a public auction here. I was unable to procure any information about this lot, but learned that the Customs office here had condemned a lot as not being genuine and had confiscated the same, and by the courtesy of Major Horner I am enabled to send you two samples. No doubt the high price now ruling has to do with this imitation." On May 6, 1884, I received another sample from a wholesale druggist, who requested an opinion as to their genuineness, stating that they had been offered for sale, and two hundredweight had been purchased, presumably in ignorance, by a London drug firm. Subsequently, on June 17, I was informed that the same cubebs were offered a second time, and not a single bid was made, and the selling broker was simply laughed at. Nevertheless, there can be no doubt that the spurious cubebs have been powdered and sold as genuine, or

mixed with the genuine, as has apparently been done in the case alluded to by Dr. Shillitoe.

It is worthy of note in connection with this subject that a species of pepper, evidently so nearly allied to cubeb, should possess properties so different to that of the genuine drug, and it may serve as a warning to wholesale as well as retail chemists to carefully examine the drugs that pass through their hands, even when presenting a genuine appearance. At the present time I have good reason to believe that there is, in commerce, a root which closely resembles the true *Pareira brava* in appearance, except in having narrower and more woody concentric zones. Although evidently belonging to the same natural order, there is no evidence as yet that it possesses similar properties.

In conclusion, it may be reiterated here that the spurious cubeb have a more bitter taste and an odor resembling that of mace.

It may also be pointed out, as a general rule, that when a drug goes up in price, it is time to be on the look out for adulteration or substitution.—*Phar. Jour. and Trans.*, May 9, 1885, p. 909.

THE BORAX DEPOSITS IN CALIFORNIA AND NEVADA.¹

It may be said in general terms that all California, south of the Chon-chilla and Tresno region and east of the coast range, is a silver and borax region. Southern Nevada is much the same. The counties of Mono, Juyo, and San Bernardino, with a part of San Diego, are the chief localities, though a remarkable line of borax deposits extends across Nevada, from west of Humboldt Sink to Desert Wells and Fish Lake, 140 miles southeast. The first discovery of borax in California was made in 1856 near Red Bluff, in the northern part of the State. The first deposits, however, successfully worked, were those of the Borax and Hachinham Lakes in Lake county, 100 miles north of San Francisco. At present the supply comes from the more easily worked and richer deposits in the sandy deserts about Death Valley and southeast of Pyramid Lake in Nevada. The first shipment of borax was made in 1864.

The crystals of borax in the mud were removed by the use of cofferdams, 4 feet square, and often nearly 1,000 lbs. were taken from one

¹ From a report on the production of borax in the United States, forwarded by Mr. L. S. Sackville West to Earl Granville.

such space. In the deepest mud stratum the small crystals disappeared and immense ones, often 7 inches and four inches thick, were discovered. These needed only solution and recrystallization to render them fit for market.

About 1868, operations ceased at Borax Lake, but continued at Hachinhama till 1873, producing annually 250,000 lbs. In 1866 the borax still remaining was estimated at 54,000,000 lbs.

In San Bernardino deposits of tincal and borated sands have attracted much attention. The product is of the finest quality, and its manufacture has been highly profitable. The marsh is twelve miles long and eight miles wide, and is worked by several English and American companies.

Borax minerals are found throughout this region in a great variety of forms, as native borax or tincal, as boracic acid, as ulexite or borate of lime, as pricente, pandermite and colemnite. Of all these the silky white balls of ulexite, often one foot in diameter, compressible, cotton-like, and similar to the Tarapacá produce, is the most attractive form.

The crude boraxes of the Pacific Coast are usually of high quality, but the chief problem is to economize labor and cost of transportation, and the effort is being made to produce the highly concentrated "boracic acid glass," 1 lb. of which is equal to 3 lbs. of common borax. The Basin of Nevada, in which the alkaline lakes or marshes of Mono, Owens, Walker, Carson, Humboldt, are situated, is covered in many parts with dry efflorescent salts, washed in the course of ages from the soda feldspar of the volcanic rocks and ridges of yellow lava which cover the country for miles. The waters of the lakes are heavy, appear like thin oil, smell like soap, possess great deterative qualities, are caustic as potash, and easily saponify.

Teel's Marsh, in Nevada, is the most productive borax field on the Pacific Coast, and its tincal deposit covers ten square miles of surface. Dr. Le Conte visited Rhode's Marsh in 1882, and found it to contain chemically pure common salt, borax in three forms, sulphate of soda and carbonate of soda, all in great quantities, and within a space of three miles square.—*Phar. Jour. and Trans.*, April 25, 1885, p. 874.

CANNABIS INDICA AS LOCAL ANÆSTHETIC.—Dr. A. Aaronson recommends diluted tincture of Cannabis Indica as a local anæsthetic in dentistry. It is mixed with three or five parts of water and frequently applied to the gums and cavities during the operation.—*Pacif. Med. and Surg. Jour.*, April, 1885.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Chinese Cabbage oil, obtained from the seeds of a species of *Brassica*, according to R. H. Davies, has at 60°F. the specific gravity .914; is of a deep brown color, somewhat thicker than olive oil, at 12°C. (10°F.) solidifies to a bright orange-yellow mass, and yields a rather dark colored elaidin. 100 grams of the oil required 0.125 gram caustic potash for neutralization, and 17.52 grams for complete saponification.

The mixture of fatty acids begins to soften at 17°C., melts completely at 22°C., has nearly the same saturating power as brassic acid, and contains oleic acid.—*Phar. Jour. and Trans.*, Feb. 7, 1885, p. 635.

According to E. M. Holmes this oil is probably obtained from the seeds of the petsai, *Brassica sinensis*, which is largely cultivated in China. The oil is employed as a purgative, and externally for skin diseases; also like a yellow colored brassica oil, which is probably obtained from *Br. campestris*, *Lin.*, the *aburana* of the Japanese. This oil is used for culinary and lighting purposes, in tobacco manufacture to prevent the leaves falling to powder after rapid drying, and for the manufacture of lampblack for use in making Chinese ink. The residue after the expression of the oil is used for manuring plantations of tea and other plants.—*Ibid.* p. 636.

Tea oil from *Camellia oleifera*, *Abel*, resembles olive oil in color, transparency and mobility, and has a characteristic odor and taste. Rob. H. Davies found it to have the spec. grav. .9175 at 60°F., and placed in a freezing mixture to deposit a solid fat, probably stearin. The oil mixed with a drop of sulphuric acid, has a behavior similar to almond oil; nitrous acid solidifies it. It contains less free acid than olive oil. 1,000 grams of tea oil require for complete saponification 195.5 grams of caustic potash; the oleic acid obtained amounted to 83.15 per cent., and about 10.8 per cent. was probably stearic or palmitic acid; an insignificant amount of fatty acid was soluble in water.—*Phar. Jour. and Trans.*, Feb. 7, 1885, p. 634.

A specimen exhibited at the International Health Exhibition was labeled oil of *Camellia japonica*. It is used in Japan by watchmakers and as a pomade, combined with Japanese wax and flavored with oil of cloves and other essential oils; it is non-drying, very fluid, free from unpleasant odor and according to E. M. Holmes could doubtless compete with almond oil and olive oil for many purposes.

In China the oil of *C. oleifera* is used for culinary purposes and as a hair oil, and is an important article of trade. The seeds of *C. Thea* were recently offered in London under the name of *tanne*, meaning seeds; they contain about 33 per cent. of oil, 13·8 per cent. of starch and 1 per cent. of theine.—*Ibid.*, p. 637.

Myroxylon peruiferum, Lin. F.—Mr. P. Macewan has examined a sample of what he calls the oleo-balsam of the red oleo, *oleo vermelho*, of Rio Janeiro, the results differing in several respects from those obtained by Th. Peckolt (see "Am. Jour. Phar.," 1881, p. 334). In bulk the balsam was dark brown, and in thin layers dark red; its odor was smoky and feebly fragrant. On tasting it, a persistent choky and disagreeable feeling was left in the throat. The spec. grav. was ·915. Petroleum spirit dissolved 63·7 per cent., leaving a light brown pulverulent resin undissolved, and on evaporation left an amber colored, faintly aromatic residue, which gave a red-brown color with nitric acid; Peru balsam left an insoluble cohesive resin and the solution in petroleum spirit yielded a straw-colored fragrant residue, giving a yellow and pale violet-color with nitric acid. The oleo-balsam was completely soluble in alcohol and in ether, and partially soluble in carbon bisulphide, separating a flocculent brown resin which became adhesive to the sides of the vessel. The most marked difference between the two balsams is the behavior with sulphuric acid; on the subsequent addition of cold water to the mixture with Peru balsam, a beautiful violet color is imparted to the surface of the mass, while a gray color is produced with the oleo-balsam. The oleo-balsam has not the fragrance which is perhaps the most valued property of Peru balsam.—*Phar. Jour. and Trans.*, March 21, 1885, p. 771.

Cultivation of Ginseng. Consul-general Aston has visited several of the numerous ginseng gardens near Songdo, Corea. The seed is sown in March; the seedlings are planted out in beds raised a foot above the level of the surrounding soil, bordered with upright slates and covered in from sun and rain by sheds of reeds 3 or 4 feet high, towards the north left more or less open according to the weather, and placed in rows with just room enough to walk between them. During the first and second year the plant has only two leaves and is frequently transplanted, in the fourth year the stem is about 6 inches high with four horizontal leaves, and in the fifth or sixth year the plant has reached maturity. Mould containing plenty of rotten leaves is the only manure used. The root is either dried in the sun or during unfavor-

able weather, over a charcoal fire; or to make the red or clarified ginseng it is placed in wicker baskets which are put in a large earthenware vessel with a closely fitting cover and pierced at the bottom with holes. It is then placed over boiling water and steamed for about four hours. The export of this quality of ginseng is a strict monopoly and death is the punishment for smuggling it out of the country. The annual amount exported to China is 202 piculs, valued at forty dollars a picul ($133\frac{1}{2}$ lbs.) The white ginseng is worth about half as much. It is the wild ginseng for which enormous prices are sometimes paid.—*Phar. Jour. and Trans.*, March 7, 1885, p. 732.

Synthesis of homoquinine (see "Am. Jour. Phar.," 1885, p. 249). By decomposing homoquinine with caustic soda and determining the amount of quinine thus produced, B. H. Paul and A. J. Cownley obtained 41.4 per cent. of quinine and 58.6 cupreine. By mixing the ether solutions of cupreine and excess of quinine and after crystallizing, determining the surplus quinine, the same authors obtained in two experiments the following figures as representing the composition of homoquinine: quinine 37.20 and 39.08 per cent.; cupreine 62.80 and 60.92 per cent. From these results the proportion of quinine and cupreine in homoquinine seems to be as 2:3.—*Phar. Jour. and Trans.*, March 7, 1885, p. 729.

Vaccinium Arctostaphylos, Lin., Trebizond tea. From communications by E. M. Holmes and W. J. T. Dyer to "Phar. Jour. and Trans.," January 17 and March 27, 1885, it appears that this tea was first prepared about the year 1877, and became a commercial article in 1880. About 5,000 ocques (the ocque = $2\frac{3}{4}$ lbs.) are manufactured annually, the cost on the spot being about 5 piastres per ocque. The plant grows in Trebizond, Kroum and other parts of Asiatic Turkey, on mountains not below an altitude of 5,000 feet, and is not found beyond the mountains of Gummo hame. The tea is manufactured by Circassian planters in the province of Roum, and has the appearance and aroma of coarse black tea, but a sweet and somewhat less astringent taste. The best quality is yielded in May, several gatherings being made during the year. The leaf is much thinner than the true tea leaf, and could, Mr. Holmes thinks, be easily distinguished by a botanist from the true tea leaf when soaked in water, should the tea ever come into use as an adulterant of cheap teas.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from p. 235.)

Ahuehnete, *Taxodium mucronatum*, *Tenore*, nat. ord., Coniferae. From the cones of this Mexican tree, Dr. T. Noriega obtained a greenish yellow volatile oil of the density 0.8259, boiling at 130° C., and having an agreeable odor; with iodine it gives a slight explosion and evolves violet vapors. The fruit contains also a red-brown soft resin of a neutral reaction, but partly soluble in hot potassa solution. The bark is used as an emmenagogue and diuretic, and the leaves, topically, against itch and as a discutient; the wood yields a tar which is useful in skin diseases, and by dry distillation an empyreumatic oil is obtained similar to oil of cade.

Ahuichichi, *Bryonia variegata*, *Miller*, nat. ord. Cucurbitaceae, grows in temperate regions and possesses dangerous drastic properties.

Aile de Mexico, a species of alnus, growing in mountainous regions, yields a bark having tonic and astringent properties.

Aje, or Axin, is a fatty substance produced by *Coccus Axin*, *La Llave*, a hemipterous insect living upon different species of *Spondias* and *Xanthoxylum*. In the fresh state the drug has a yellow color and a peculiar rancid odor, fuses at 35°C., is soluble in hot concentrated alcohol and in ether, is readily saponified, and on exposure is converted into a hard brown substance, insoluble in water, alcohol and ether. The natives of Uruapam form aje into masses weighing 350 gm. and enveloped in leaves of Indian corn. It is popularly used in erysipelas, as a discutient and vulnerary, mixed with various substances in hernia, and as a poultice in uterine complaints; in the arts it is used as an excellent varnish for wood and metals.

Ajo, *Allium sativum*, *Lin.*

Ajolote, *Siredon Humboldtii*, *Dumeril*, and other species, nat. ord. Batrachia. The flesh has analeptic properties, and the syrup prepared from a decoction of the skin is used by common people as a cure for pulmonary affections.

Ajonjolí, *Sesamum orientale*, *Lin.* The oil is used in place of olive oil, the seeds as a condiment, and the press cake as food for cattle.

Álamo, *Populus alba* and *P. nigra*, *Lin.* The bark is astringent; rarely employed.

Albahaca, *Ocimum Basilicum*, *Lin.*, nat. ord. Labiatae. Cultivated in Mexico. It is a diffusible stimulant and stomachic.

Alcabucl, *Cynara Cardunculus*, *Lin.*, nat. ord. Compositae. The unexpanded flower heads are used for food, and the florets for coagulating milk.

Alcachofa, *Cynara Scolymus*, *Lin.* The unexpanded flower heads are used for food. (These are the artichokes of Southern Europe, the preceding species being known as cardoon, the blanched tender stalks and ribs of leaves being eaten.)

Alcanfor del Japon, Camphor. Dose, 0.05 to 1.0 gm.

Alcaravea, Caraway. An infusion is made of from 5 to 10 gm. for one liter of water.

Alfalfa, *Medicago sativa*, *Lin.*, nat. ord. Leguminosae. Emollient. Used for fodder.

Alfilerillo, *Geranium Cicutarium*, *Lin.* The herbaceous portion is used in decoction as an emollient.

Algodon, Cotton from *Gossypium herbaceum* and *G. arboreum*, *Lin.*, growing in Mexico, etc.

Alholva, Fenugreek. Cultivated in Mexico. The seeds are emollient.

Alhucema, *Lavandula vera*, *Lin.* The flowers are used as a perfume, and the powder as a sternutatory; internally as a stimulant.

Almáciga, Mastich. Balsamic stimulant and recommended in incontinence of urine. Dose, 0.60 to 2.0 gm. Used for varnishes, and dissolved in ether or collodion for filling carious teeth.

Almendra amarga and Almendra dulce, Bitter and sweet almonds.

Almidon, Starch, especially wheat starch.

Almizele, Musk from *Moschus moschiferus*, *Lin.*

Alpiste, the fruit of *Phalaris canariensis*, *Lin.*, nat. ord. Graminae. The plant grows in Mexico; the fruit is principally used for birds' food and the meal is employed as an emollient.

Alquimila del país, *Geranium Hernandezii* and *G. mexicana*, *Humb. et Bonpl.*, nat. ord. Geraniaceae. It is incorrectly used as a substitute of the mildly astringent *Alchemilla vulgaris*, *Lin.* The plant is emollient and the juice is used as a laxative for children.

Altea, Marshmallow root. In Mexico, the root of *Malva angustifolia*, *Caranilles*, is usually used in place of the former; it has identical properties, the mucilaginous principle being contained chiefly in the bark.

Alverjon, Pea, *Pisum sativum*, *Lin.* Used for food.

Amapola, the petals of *Papaver Rheas*, *Lin.*, which grows in Mexico. From 2 to 5 gm. are used for 1 liter of infusion.

Ámbar amarillo, Amber; antispasmodic; rarely employed.

Ámbar gris, Ambergris; rarely used as an antispasmodic. Dose, in powder, 0.25 to 1.0 gm., of the tincture, 20 to 60 drops.

Ámbar del país, the exudation of *Hymenaea Courbaril*, *Lin.*, nat. ord. Leguminosæ, growing in the State of Oaxaca, and known there as *cuapinole*. The resin is bright yellow, internally transparent, superficially of an efflorescent appearance, brittle, with a glossy fracture, of a delicate aromatic odor and resinous somewhat astringent taste, soluble in alcohol, ether, fats, and volatile oils, burning with flame and then forming drops of a balsamic odor. It is distinguished from true amber by becoming sticky with a little alcohol or ether. It is used in the manufacture of varnishes, and as fumigation for the relief of asthma. The bark is said to be purgative, and a decoction to be useful as a vermifuge. The tincture is employed like that of guaiacum.

Ambarina, *Seabiosa atropurpurea*, *Lin.*, nat. ord. Dipsacæ. The plant is cultivated and is commonly used in itch and other skin diseases; it has tonic and sudorific properties, but is not used medicinally.

Amianto, Asbestos; used for filtering acids and alkalis.

Amole de bolita, *Sapindus amolle* (?). The flowering tops and fruit may be used like saponaria, according to Oliva; they contain considerable saponin.

Amole de raíz, *Agave mexicana*, *Lamarek*, nat. ord. Amaryllidacæ. The juice has emmenagogue, diuretic and laxative properties, and is externally used against itch. The root is useful for washing clothes.

Amor seca, *Gomphrena procumbens*, *Lin.*, nat. ord. Amarantacæ, one of the so-called "everlastings," is indigenous to the central table land of Mexico and has a tonic, astringent and diaphoretic root.

Anacahuite, *Cordia Boissieri*, *De Cand.*, nat. ord. Boraginacæ, is found in the mountains of Tampico; the wood is commonly regarded as being pectoral, and medicinally used as an emollient.

BROMIDE OF ARSENIC FOR PIMPLES is recommended by Dr. Piffard, who uses a one per cent. solution, of which one or two minims are to be taken in a wineglassful of water three times a day, on an empty stomach. The dose is to be diminished as the pimples begin to disappear.—*Med. Age.* That such a solution contains HBr and As₂O₃ was shown in *Am. Jour. Phar.*, 1883, p. 226.

THE GAMBIER OF JOHORE.¹

BY PETER MACEWAN,

Secretary in Scotland to the Pharmaceutical Society.

(Including Notes by Mr. Robert Jamie, late of Singapore.)

In the Edinburgh Forestry Exhibition, the Maharajah of Johore exhibited an interesting collection of the products of the territory which he governs. The articles of pharmaceutical interest included in the exhibit were Gambier, Baros or Borneo camphor, and india-rubber, and these have already been briefly referred to in the "*Pharmaceutical Journal*" ([3], xv., 266). The specimens of gambier and baros camphor were presented to the Edinburgh Museum of Science and Art, the director of which (the lamented Professor Archer) presented two sets of duplicates to the Pharmaceutical Society.

There is little or nothing given in Pharmaceutical literature regarding Johore products, and for this reason these notes may not be devoid of interest. Moreover, the State is likely to be of some importance in commerce, from the fact that in recent years its resources have been greatly developed by the encouraging example and influence of the enlightened Maharajah. The Johore territory is some twenty thousand square miles in extent, and it is for the most part covered with virgin forest which has been only partially explored. The population, consisting of Malays and Chinese, numbers one hundred thousand. Its principal exports are, in addition to timber, cutch, black pepper, gambier, dammar, and recently india-rubber, the production of which is entirely due to the Maharajah. The Johore Steam Mills Company has done much to open up the country, and the Maharajah takes full advantage of European influence and enterprise. Mr. J. Meldrum, F.R.G.S., who acted as his commissioner at the Forestry Exhibition, is closely associated with him in the development of trade.

The following extract from a letter received from Mr. Jamie is of interest: "About Johore and its forest extent, I may say that the native State of Johore is almost one impenetrable vast forest, extending from the British possession, Malacca, to the extreme point of the Malay peninsula, Point Roumania, bounded on the northeast by the native States of Pabany and Tringanan, and up to this time very imperfectly explored. For many years the Chinese have been cultivating various vegetable products, such as earth-nuts, sweet potatoes, etc. (sugar cane is grown, but this chiefly for chewing purposes); but what has cleared most of the forest has been the cultivation of gambier and pepper, which is principally done by the Chinese, and very successfully, too. These products are being largely increased every year, in fact, they may be said to be the principal products as yet. Within the past few years large tracts of the forest have been cleared out and many fine and very valuable timber trees destroyed to allow of coffee being cultivated, especially the Liberian kind, which it is hoped will turn

¹ Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, March 18, 1885.

out remunerative to the cultivators. Tapioca is also cultivated to a small extent, so is the tea plant; this latter chiefly by His Highness the Maharajah himself. The territory of Johore is every year being better known as explorers advance."

Regarding the forests, Mr. Meldrum remarks: "The magnitude and grandeur of the forests may be viewed from the summit of the mountain *Gunong Pulai*. * * * As far as the eye can reach, nothing can be seen but trees. There are no less than three hundred and fifty different kinds of wood shown in the Forestry Exhibition, all from the Johore forests."

Gambier Production.—The cultivation of gambier in Johore does not differ from the method pursued in the Straits Settlements, that is to say, it is cultivated along with black pepper. On this point, Mr. Meldrum¹ says: "Black pepper * * * is invariably grown by the gambier planter (always Chinese), as he can use the spent leaves of the gambier plant to manure his pepper vines. The prices of gambier and black pepper have been good for some time past, partly owing to the war in Atcheen and partly owing to the difficulty of procuring forest land for new plantations. The straits and countries near appear to be specially adapted for the growth of gambier." The plant cultivated is presumedly *Uncaria Gambier*; whether other varieties are under cultivation or not is doubtful. Here I may quote from the "Kew Report," for 1881, an item of some interest:

"*Uncaria Gambier*.—Dr. Trimen, director of the Royal Botanic Gardens, Peradeniya, writes (September 24): 'In the urgent demand for raw products here, I tried to make some gambier from our plant. It grows, commonly, not far from the garden. I followed the account given in the books, but could not succeed in producing the correct article. A very excellent astringent extract is easily obtained, but it is black like liquorice or the *Acacia Catechu* extract, and not at all like *Terra japonica*.' * * * The Ceylon plant is not the same, as Dr. Thwaites at first supposed; it is *Uncaria dasycarpa*, var. *Thwaitesii*, and this, as Dr. Trimen points out, may account for the different properties."

A lucid description of the manufacture of gambier is given in "Pharmacographia," and from the same source we learn that the gambier industry was begun in Singapore (an old Johore possession) as early as 1819. Since then it has developed enormously in the Straits Settlements and surrounding countries. Thus, in the north and northwest of Borneo, the industry in the hands of the Chinese has been most successful, the value of the product exported in 1882 from Sarawak to Singapore being 118,351 dollars. The value of gambier annually imported into Great Britain is fully half a million pounds sterling. I endeavored from blue books and similar sources to get some information as to the amount of gambier produced in Johore, but failing in this I applied to Mr. Jamie, late of Singapore, and he has sent me a most interesting letter from which I may quote:

"To say what the value of gambier and pepper annually sent out from

¹ In a lecture on "The Johore Forests." For these references and other information I am indebted to Mr. Walter Clark, of the Edinburgh Museum of Science and Art, whom I warmly thank.

Johore would be, I could not; but I know that many thousands of piculs (133½ lbs.) of both are sent to Singapore, from whence it is shipped to all parts of the world. Singapore is separated from Johore by what is called the 'Old Straits,' about three-quarters of a mile wide, and Johore being so close to that city (Singapore), the imports and exports may not be kept separate, which may account for your not seeing the exact returns in blue-books or consular reports, though I am inclined to think they are kept, but may not be published as from Johore. * * * Cube gambier is the kind most generally preferred for export, and can be procured in various qualities according to price, that is either pure or adulterated.¹ Gambier for chewing is made in disc and pipe form. The latter is in short thin sticks like the drawing in your letter, and can generally be got pure in either the Johore or Singapore bazaars. Gambier is also made in cake or mass, and it is worth 5.55 dollars per picul at Singapore. No. 1 cube gambier, 6.85 dollars and No. 2 cube, 6.25 dollars per picul."

The Johore gambier of the Forestry collection is of five kinds: three of cube form, one disc shaped and the other oblong (*parallelopiped gambier*). One of the cube specimens (which proved to be the best of its kind) is labeled "Gambier, *Makan*, for eating." The oblong variety is designated "Gambier, *Paku*." The disc-shaped kind is stated to be "first quality, for eating."²

The following details regarding the specimens have been ascertained:

Cube Gambier, First Quality ("Makan").—This is in fairly regular cubes, average measurement 26 × 24 × 22 millimetres. It is light, the average weight being 8.475 grams (heaviest, 8.78; lightest, 8.08). The external color is cassia brown "marled" with a darker brown. Appearance of fusion at the edges is slight, fused parts having been cut off. Internally the color is pale cinnamon-brown. The mass powdered readily, with a crumbly feeling and without grittiness. On incineration, 3.96 per cent. of ash was obtained, and by Löwenthal's process, 32 per cent. of "tannin" (calculated as gallotannic acid) was indicated.

Second Quality.—In badly formed irregular cubes. Average measurement 26 × 25 × 24 millimetres. Average weight 13.53 grams (heaviest, 14.45; lightest, 12.17). The surface is in a fused state, so that the color is brown-black; internally, however, it is cinnamon-brown. Denser and harder than first quality, hence not so readily reduced to powder. It yielded 4.48 per cent. of ash, and 30 per cent. of "tannin."

Third Quality.—This is in well-shaped cubes, but surfaces more uneven than first quality. The cubes are slightly smaller than first quality. Average 25 × 23 × 22 millimetres, but they are much heavier, the average

¹ "I mean 'pure or adulterated' commercially speaking. Gambier, as prepared by the Chinese, can never be absolutely pure. The plant grows trailing along the ground, and unless the leaves and stems which are cut off be washed before being put into the boiling caldron, the extract must contain more or less earthy matter. Few Chinese wash the leaves, and the straining of the decoction is of the roughest description. Merchants buying gambier have a rough and ready method of judging what they consider standard quality; below that quality less is paid, because it contains earthy matter *intentionally added* to make it weigh.—R. J."

² "Makan," vernacular for "eating or chewing." "Paku," a nail.

weight being 10.24 grams. The color externally is dull brown; internally, pale brown to yellow-brown. Admixture of woody matter is apparent. The powder obtained from it is gritty, due to inorganic matter. 10.76 per cent. of ash was obtained from it, and the "tannin" content is 19.7 per cent.

As affording an indication of how these specimens compare with the gambier of pharmacy, I give particulars of two samples which happened to be the first which I came across, but I hope that they are not of the nature and quality generally found. Let me call them A. and B.

A. is in badly formed pieces. Externally the color is dark brown from fusion; internally, a good cinnamon-brown. Somewhat tough to powder, but not gritty. It yielded 4.5 per cent. of ash and 15.6 per cent. of "tannin."

B. in well-formed cubes. Brown color externally, no fusion marks. Pale cinnamon-brown internally. Difficult to powder and gritty. It yielded 17.3 per cent. of ash and 9.13 per cent. of "tannin." I could not detect starch in the samples.

Passing on now to the masticatory gambiers (so called from the fact that they are used as masticatories instead of betel nut),¹ the peculiar shapes attract attention. The forms, though rarely seen by the pharmacist, are not new. Pereira, in his "*Materia Medica*,"² describes them; the oblong as *gambier of the second quality* (Bennet), and the cylindrical as the *third quality*. Of an oblong specimen,³ which he received from Professor Douglas MacLagan as *yellow gambier in parallelopipeds*, he states that "the length of the prism is 2 inches; the size of the terminal faces $\frac{1}{2}$ an inch square. In other respects the oblong variety agrees with the square kind." Of the cylindrical variety he remarks, "This occurs in circular discs, or short cylindrical pieces, the length of the cylinder being only about $\frac{1}{3}$ of an inch, whilst its diameter is about 1 $\frac{1}{4}$ inches. * * * The color internally is pale, dull, pinkish yellow; externally being a shade darker."

The Johore parallelopipeds have only about half the measurements of Pereira's specimen, and the color is of a uniform dull brown externally, and drab internally. It is exceedingly hard and stony. On attempting to incinerate a small piece it failed to fuse and swell up, as even the worst sample of gambier will; it only became black. Powdered, it incinerates with difficulty, the yield of ash being 69.6 per cent. The "tannin" content is small, viz.: 2.08 per cent. Its taste is mildly astringent and sweetish. When chewed exceeding grittiness is felt between the teeth; this is due to a large admixture of sand, which is deposited when the powdered "gambier" is treated with hot water. This variety probably fulfills the same functions for the embryo betel-nut eater as the mild cigarette fulfills for the juvenile smoker.

The cylindrical gambier is a little larger than Pereira's specimen. The

¹"Gambier is also used *along with betel nut*, sirih leaf and lime. The leaf is that of a vine (*Chavica* species), grown very much as pepper, and is chewed by Malays, Siamese and many other Eastern people. On this leaf is spread a little lime and tobacco, gambier and pieces of betel nut.—R. J."

²Third edit., vol. II, part II, p. 1685.

³These and other specimens described by Pereira are in the Pharmaceutical Society's Museum, London.

average diameter is 37 mm. (about $1\frac{1}{2}$ inch) and thickness, 6 mm. It also differs from his in the density; his sank in water, but the Johore variety is very light and floats on water. The average weight of the discs is 3.28 grams (heaviest, 3.94; lightest, 2.85). The color approaches Pereira's description, the lower surface being darker, if anything, than the upper. A peculiarity of the Johore discs is the ring markings on the surface. Some have two, others one ring only, about a third of an inch from the edge, and the same distance apart when there are two. The one ring marking gives the disc the appearance of a cortical layer, such as we see in calumba root for instance. One piece is marked on the top surface with three transverse parallel grooves, but this appears to be accidental. This gambier incinerates easily and yields only 1.63 per cent. of ash, light in weight and milk white. The "tannin" content is 2 per cent. The small percentage of ash is remarkable. Flückiger and Hanbury¹ incinerated some fine gambier in regular cubes and obtained 2.6 per cent. of ash, and this is given, I presume, as a very low percentage.

These specimens are quite different from those mentioned by Pereira. The disc-shaped specimen is particularly remarkable, owing to its small percentage of ash and low "tannin" content. Yet I have failed to detect any adulterant in it. It would appear to have been prepared with unusual care and from clean leaves, the explanation of the low "tannin" content being that the decoction has not been subjected to prolonged boiling, which favors decomposition of catechin, catechu-tannic acid being one of the products of decomposition. The cube gambier is of good quality; all are apparently equally soluble in boiling water, so that this test afforded little indication of the quantity of inorganic matter present. It would be well if a maximum of ash were also given in the forthcoming pharmacopœia. Mr. Jamie informs me that a very light clay or earth (which is eaten by the natives) is used for adulterating gambier, and that adulteration with starchy matter is rarely or never resorted to. The latter adulteration would give the makers too much trouble; hence they resort to the more handy clay. A sample of lozenge gambier (supposed to be amylaceous) which I have examined contains no starch, but abundance of a fine light earth, such as tripoli; yet the specimen floats on water.

The figures which I give for "tannin" are not to be taken as an absolute indication of the catechu-tannic acid present. They are comparative and are given as gallotannic acid, owing to the uncertainty attached to values given for the "tannin" of gambier.

The authors of "Pharmacographia" do not state the percentage of "tannin" in gambier. Mr. Thomas Christy ("New Commercial Plants and Drugs," Part V., pp. 40-41) gives 36 to 40 per cent. and 44.88 per cent. (on the authority of Esenbeck). Mr. John Watts (*ibid.*, p. 50) says: "Gambier and cutch with your apparatus [Rampacher's tannometer] give over 40 per cent., while gambier gives with gelatin 20 to 25 per cent., and cutch about 30 per cent." Comparing the Johore cube gambiers with these figures they stand out very favorably, while the two commercial samples which I have examined are very bad.—*Phar. Jour. and Trans.*, March 28, 1885, pp. 793-795.

¹ "Pharmacographia," first ed., p. 301.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

American Medicinal Plants; an illustrated and descriptive guide to American plants. By C. F. Millspaugh, M.D. New York and Philadelphia: Bericke & Tafel. Nos. 6 to 10. Price, \$5.

This is the second fascicle of a work, which we have noticed on two occasions, in 1882 and 1884, when its scope and general make-up was considered. The fascicle now before us contains 30 plates, with the requisite letter-press. Many of the plants figured, like *Taraxacum*, *Senecio*, *Scrophularia* and *Cephalanthus*, are common in most parts of the United States, while *Gelsemium* represents the South, *Anemone Nuttalliana* the West, *Thuja* the Northern section, *Ranunculus acris* the naturalized plants and *Fagopyrum* the cultivated plants. The plates are handsomely executed, and the coloring is as nearly true to nature as may be reasonably expected; occasionally some of the details have not received full attention, as in the case of *Podophyllum*, the rhizome of which has, as a rule, the rootlets in tufts at the end of the annual shoots, but rarely on the lower and thinner portion, and in *Geranium maculatum*, the flowers of which have 10, not 12 stamens. The botanical descriptions are pretty full and accurate. The work deserves the attention of those interested in medical botany.

The Microscope in Botany. A guide for the microscopical investigation of vegetable substances. From the German of Dr. Julius Wilhelm Behrens. Translated and edited by Rev. A. B. Hervey, A.M.; assisted by R. H. Ward, M.D., F.R.M.S. Illustrated with 13 plates and 153 cuts. Boston: S. E. Casino & Co., 1885. Svo. pp. 466. Price, \$5.

This is a most valuable addition to the works on microscopy published in the English language. It opens with an introductory chapter devoted to the history of the microscope and its gradual perfection, and to the manner in which microscopical work and investigations should be conducted. The pertinent advice given at the close of this chapter applies with equal force to scientific work in general, and culminates in the following four indispensable characteristics, necessary for reliable investigations, namely, a skillful hand, good eyes, a tranquil mind and self-knowledge, the latter being, perhaps, the most important. About 140 pages are next devoted to the consideration of the compound microscope, its various parts and accessories, all of which are fully and clearly described, their uses explained and amply illustrated. Then follow about 110 pages on the preparation of microscopic objects, including softening of tissues, cutting in various ways, clarification, mounting and drawing of sections, labeling and storing of preparations, and examination of living organisms.

The fourth chapter treats upon about 45 pages of the various microscopical reagents, inorganic as well as organic, including among the latter the various staining liquids. The concluding chapter on the microscopical investigation of vegetable substances occupies over 140 pages and discusses the composition of the walls of different kinds of tissue and the various cell contents with the means of recognizing the tissues, incrustations and contents under the microscope.

This brief synopsis will indicate the scope of the book before us, which is eminently practical. The text is so clear and attractive in style, as to become inviting to experimentation and research. This is particularly the case with the third and fifth chapters, in which the earnest student will find a vast amount of facts and suggestions that will render material aid in the practical performance of the delicate operations which must be mastered in order to become proficient in the histological investigation of plants. The translators and editors have done their part well and made numerous additions, more particularly relating to American microscopes as compared with the Continental and English styles, and to various tools, methods and other practical points valuable in the prosecution of microscopic work.

The book is printed in clear type upon good heavy paper; the illustrations are unexceptionable; numerous references to the literature on the various subjects will be particularly appreciated by special students, and all who consult the work, will appreciate the full index which leaves little to be desired.

Tracts on Massage, No. 1. The art of massage. Translated from the German of Reibmayr, with notes by Benj. Lee, A.M., M.D., etc. Philadelphia, 1885. 8vo, pp. 40. Price 25 cents.

This is the first of a series of publications, which will contain the substance of a treatise of Dr. A. Reibmayr, of Vienna, with notes by Dr. Lee, based upon an acquaintance of 25 years with massage, "the latest handmade of medicine."

Untersuchungen aus dem Pharmaceutischen Institute der Universität Dorpat. Beiträge zur gerichtlichen Chemie. Von Prof. Dr. G. Dragendorff. St. Petersburg, 1884. 8vo, pp. 73.

Researches from the Pharmaceutical Institute of the University of Dorpat. Contributions to forensic medicine.

The investigations comprise the conditions under which a number of medicinal agents may be recognized in the animal body, and the complications which may arise from their presence in the analyses of food, etc., for poisonous substances. The researches have been made by students of Prof. Dragendorff under his supervision and embrace quinidine and cinchonidine; the alkaloids of the berberidaceæ; berberine, oxyacanthine and hydrastine; coffeine and theobromine; morphine; the alkaloids of chelidonium; lyeaconitine; picrotoxin; santonin; colocynthin; elaterin and strychnine.

Bericht über die Thätigkeit im Pharmaceutischen Institute der Kaiser. Universität Dorpat in der Zeit vom 1. Jan. 1865 bis 31. Decbr. 1884, von dem derzeitigen Director Prof. Dr. G. Dragendorff. St. Petersburg, 1885. 8vo.

Report on the activity in the Pharmaceutical Institute of the Imperial University of Dorpat from Jan. 1, 1865 to Dec. 31, 1884.

This report covers the time during which the indefatigable Prof. Dragendorff has been in charge of the Institute named above, a period of twenty years marked by well directed and efficient labor. During the time men-

tioned the number of students at the University has increased from 560, including 146 medical and 35 pharmaceutical students, in the beginning of 1865, to 1,595, including 671 medical and 120 pharmaceutical students at the close of 1884. During the same period the number of laboratory students has increased from 72 in 1865 to 330 in 1884, and in connection with this increase it should be mentioned, that it is largely due to medical students making use of the opportunities afforded at this laboratory; for while in 1867 there were 34 medical and 57 pharmaceutical students, or a proportion of 100 : 168 working in the laboratory, the numbers in 1884 were 225 medical and 105 pharmaceutical students, the proportion being 100 : 47. The pamphlet gives also accounts of the growth of the collections, the arrangement of the laboratory and of the work done therein and contains the titles of 278 books, pamphlets and essays, published during that time by the director and his pupils, the investigations for nearly the whole number having been made in the laboratory of the Pharmaceutical Institute.

Neue Ideen. Von Mr. Ad Vomáčka. Leitmeritz, 1885.

New Ideas.

The object of this little pamphlet, which is a continuation of a larger one entitled "Handverkaufs-Artikel," is to furnish formulas for new preparations and specialties making their appearance, and thus to enable the pharmacist to supply his own products to his customers. for which purpose suitable labels have been prepared by the author, and these may be procured in case the sales do not warrant the expense incidental to the designing and printing of distinct labels. All plans aiming at making the pharmacist the purveyor of his own products, instead of the products of others, deserve commendation.

Massage, the latest handmaid of medicine. By Benj. Lee, A.M., M.D., Ph.D. From Transactions of the Medical Society of the State of Pennsylvania. Pp. 12.

A clinical illustration of the value of combining motion with extension in the treatment of diseases of the hip joint. By Benj. Lee, M.D., etc. From the same Transactions.

The treatment of diseases of the skin by novel means and methods. By John V. Shoemaker, A.M., M.D., etc. Read before the International Medical Congress at Copenhagen, August 12, 1884.

Cumberland Almanac for 1885. Issued as a supplement to the Nashville "Journal of Medicine and Surgery," 1885.

The advertising sheet of this Almanac praises a number of nostrums.

TARTARALINE, as sold by grocers in Great Britain, was found by P. MacEwan to be acid potassium sulphate. Subsequently Mich. Conroy met with *cream of tartaraline*, a mixture of the former salt and potato starch, the latter having evidently been added with the view of reducing the strongly acid salt to a strength about equal to that of cream of tartar.—*Phar. Jour. and Trans.*, November, 29, 1884, p. 434.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, May 19, 1885.

Mr. Robbins was called to the chair, and it was moved to omit the reading of the minutes of the last meeting.

The Formulary of non-official Preparations of the District of Columbia, and the Extra Pharmacopœia of Martindale & Westcott, Second Edition, London, 1884, were presented by the Registrar on behalf of Prof. Maisch, who was absent from the city.

A handsome collection of rare drugs was exhibited, which were received last week from Prof. Herrera, of Mexico. Notices of them will be given in the "Journal of Pharmacy" as soon as practicable. The list of them is as follows:

Mexican valerian; *Hibiscus Sabdarifa*, *Linne*; *Croton Adenaster*? the herb; *Veratrum frigidum*, *Schlechtendal*, fruit, rhizome and bulb; *Mammee-Sapota*, *Lucuma Bonplandii*, *Kanth*; *Yerba del Pollo*; *Elæis melanococca*, *Martius* (seed and expressed oil); *Anona Cherimolia*, *Miller* (seed); *Anona glabra*, *Linne* (seed); *Erythrina coralloides*, *De Candolle* (seed); *Cantharis quadrimaculata*; *Cantharis encera*; *Meloe tridentatus*; *Myroxyton Pereire*, *Klotzsch* (legumes).

There was also exhibited a very interesting collection of drugs from Central America, which was donated by our fellow-member Mr. Wm. R. Warner. The collection contains the following:

Verbena (*Stachytarpha jamaicensis*, *V.*); Balsa fruit, China root; *Contrayerba* (*Dorstenia Houstoni*, *Miller*); Banana Root (*Musa sapientum*, *Lin.*); *Cevadilla* (fruit and seed), *Asagrea*?; *Lengua cerna* (fleshy branches); *Siempre Viva* leaf and flower, fresh and 3 years old; *Zacate limon* (species of *Andropogon*).

The thanks of the College was voted to the donors of these specimens.

Mr. Wallace Procter exhibited a specimen of *Crystallized Glycerin*, and read a paper descriptive of the same. The paper was referred to the Publication Committee (see page 273).

A specimen of *False Cubeb*s was exhibited; it was sent to this city from New York. It contains about seven per cent. of volatile oil. When cut open the seed appears much more fully developed than in good commercial cubeb and the powder has an aromatic odor reminding one of mace. A description appeared in the "Pharmaceutical Journal and Transactions," but the botanical origin of the drug is not yet ascertained (see page 302).

Mr. Blair exhibited a specimen of *Syrup of iodide of iron* made after the formula of the present Pharmacopœia, which had been exposed to direct and diffused daylight for two years past and was in good condition.

On motion, adjourned.

THOS. S. WIEGAND, *Registrar*.

THE AMERICAN JOURNAL OF PHARMACY.

JULY, 1885.

ON ARBUTIN, THE BITTER PRINCIPLE OF THE COW- BERRY (VACCINIUM VITIS-IDÆA, LIN.).

BY EDG^r CLAASSEN.

In this Journal (July number, 1870), I announced the existence of a bitter principle, vacciniin, in the leaves (resp. the whole plant) of the cowberry, and described its preparation from the same.

At the same time I also published several properties of it, but could not then give the matter a thorough investigation. It was not until now that I had leisure to continue the examination, and to state that the bitter principle found in that plant is not a peculiar one, but identical with another already known, viz., with arbutin, the bitter principle occurring in several other ericaceous plants, particularly in *Arbutus Uva Ursi, Lin.* In order to come to the above conclusion, a series of tests were made with the above vacciniin, and these were compared with tests made with arbutin prepared for this purpose from the leaves of *Arbutus Uva Ursi, Lin.*

Before describing these tests I may be allowed to say that there was no difference perceptible either in the form and shape of the crystals of both these bitter substances under the microscope (they form four and six sided prisms, with a doma, *i. e.*, two planes, sharpening their ends), nor in their solubility in water, alcohol and ether, and also not in their bitter taste.

The tests made were the following:

1. Heated on platinum foil, both melt to a clear liquid (which by and by turns black), and are entirely consumed by increased heat.
2. Heated in a glass tube, both melt at first, then turn black, and give off fumes of a peculiar smell and of acid reaction.
3. Concentrated sulphuric acid, and also hydrochloric acid, dissolve both without color.
4. Concentrated nitric acid colors both orange, then dissolves them

under evolution of red fumes, forming a reddish yellow solution, which after dilution with water is yellow.

5. The solutions of both in water are not precipitated by an alkaline copper solution, platinum chloride, corrosive sublimate, acetate and basic acetate of lead, a solution of iodine in potassium iodide, tannic and gallic acids.

6. A very dilute solution of ferric chloride colors both blue; they give then with water a blue solution.

7. A solution of phosphomolybdic acid and ammonia added to their solutions produces an intensely blue colored liquid, which after some time turns greenish, and after a longer time the color disappears entirely.

8. The solutions of both boiled for some time with very dilute sulphuric acid, then made alkaline by potassium hydrate and heated with an alkaline copper solution, furnish a deposit of copper protoxide (by the glucose formed).

When preparing arbutin, it is, as I have found, of value to see that the liquid containing it when evaporated has no acid reaction; the acid in it may be sulphuric, hydrochloric, citric or acetic acid, because they decompose the same, as experiments made (see below sub 1 and 2) will prove. In order to avoid this decomposition, and to collect the whole amount of the arbutin present, it is necessary, after having precipitated the decoction of the leaves by basic acetate of lead, and the filtrate by sulphuretted hydrogen, to neutralize the free acetic acid by calcium or magnesium carbonate.

1. 0.2 gram of pure arbutin, dissolved in 20 cubic centimeters of diluted (5 per cent.) acetic acid, gave, after 15 minutes' boiling in a flask (meanwhile restoring from time to time the evaporated water) with an alkaline copper solution, a plainly visible reaction of glucose; after $\frac{1}{2}$ hour's boiling the amount of glucose had increased considerably.

2. 0.2 gram of pure arbutin boiled in the same manner with 20 cubic centimeters of water, containing 3 per cent. of citric acid, gave a fair reaction of glucose after a lapse of 10 minutes already.

Before closing this article I will mention that the fruit of the American cranberry, of which enormous quantities are brought into the market, has besides an acid a decidedly bitter taste. A small quantity of the berries was crushed under addition of water and an excess of quick lime, the mixture pressed, and the liquid filtered. The filtrate gave

with ammonia and phosphomolybdic acid the above described blue color. Crystals of arbutin, however, could not be obtained, which was probably due to the very small amount of it present in the small sample of berries. If the blue color formed in liquids by ammonia and phosphomolybdic acid is, as is suggested in this Journal, characteristic for the presence of arbutin, there can be no doubt that the formation of it in the filtered juice of the American cranberries proves the presence in them of this bitter principle.

NOTE BY THE EDITOR.—The above paper is an interesting and important one, on a subject of phytochemistry which has received considerable attention in previous volumes of this Journal. Thus far the existence of arbutin has been proven for the leaves of a number of sempervirent species of the groups Ericinæ and Pyroleæ, of the natural order of Ericaceæ; Mr. Claassen's paper shows the same principle also to exist in the leathery leaves of a plant of the group Vaccinæ, thus rendering it more probable that arbutin may be found in all ericaceous plants, at least in those with leathery leaves. In 1871 ("Am. Jour. Phar.," 1871, p. 235) we pointed out the possibility of the identity of vacciniin with arbutin. When, in 1874 (*Ibid.*, 1874, p. 315), we thought the former might possibly be calcium kinate, we overlooked Mr. Claassen's statement (*Ibid.*, 1870, p. 208), that the principle is *not* precipitated by subacetate of lead; moreover, calcium kinate crystallizes in a different form (four-sided scales), is insoluble in alcohol, and is tasteless. We are indebted to Mr. Claassen for specimens of both principles.

The results obtained as above make it of interest to ascertain the behavior of the leaves of the American cranberry, an investigation which Mr. Claassen informs us he will soon undertake.

Choline in Hops.—Drs. Griess and G. H. Harrow have separated choline, $C_2H_4(OH).NMe_3.OH$, from hops by adding to a concentrated extract, acidified with chlorhydric acid, a solution of iodine in iodhydric acid. The semi-solid precipitate obtained, a choline periodide was boiled with water to expel iodine, and the resulting solution of choline iodide treated with silver oxide; the impure choline in the solution was then converted into the auro-chloride, which was recrystallized. In this manner they have not been able to obtain more than $\frac{1}{50}$ th per cent. of choline from hops. They consider it not improbable that it exists in loose combination with resin, as they find that a very dilute aqueous solution is capable of dissolving comparatively large quantities of hop resin, the liquid being then of an intensely bitter taste. Employing the same method, they have also extracted choline from beer.—*Chem. News*, March 27, 1885, p. 149.

OHIO WINE, ARGOLS AND COMMERCIAL TARTARIC ACID.

BY JAMES O. HOWELLS, PH. G.

From an Inaugural Essay.

The cultivation of the grape and the making of wine have become important industries in this country, and several of our States like California, New York and Ohio, have made such progress as to have attained no little notice from the annual production of enormous quantities of this fruit. I shall speak more of the Ohio culture as I was privileged to obtain the information from Ohio wine growers. With the review I also append the result of an examination of argols obtained from the Ohio wine, and of tartaric acid as found in commerce.

The chemical work was done in the laboratory connected with the Philadelphia College of Pharmacy.

The choice of land in selecting a location for planting a vineyard is usually the hillside flanking a river, and having loose, warm soil and a southern exposure. An abundance of sunlight is a necessity, while the hill serves as a shelter, to the growth, from strong winds. Sudden changes of temperature are to be guarded against, and this also is a consideration in the selection. The planting is usually done by "cuttings" consisting of a portion of the old stem and a branch of the previous year's growth. These are placed in a series of rows six or eight feet apart and about the same distance between each cutting. During the fruiting season the vines become so heavy that artificial support has to be given them, which is accomplished by means of four or five wires strung along in rows attached to posts, much similar to the modern barbed wire fence.

In the months of March and April as the sap is beginning to flow the vines are trimmed, this being done to give it strength and it bears more fruit if cultivated. If left alone the branches would throw out long slender tendrils that only take the sustenance from the vine with no return, as the climbing and support, the office of the tendrils, is done artificially. The trimmed branches are tied to the wires by the use of willow shoots, this operation being done once or twice during the summer. The flowers appear about the month of June, and the fruit ripens during September and October. The fruit for most uses is gathered when fully ripe; for its excellent flavor is best appreciated at

that stage, either for table use or making wine. When shipment is done, however, the fruit is gathered scarcely ripe as it withstands transportation much better. European growers have a method of hastening maturity of the grapes which consists of removing the bark about half an inch long just below the cluster of fruit. This not only hastens the ripening, but increases the size sometimes to the extent of fifty per cent. The fruit certainly has a superior appearance, but at the loss of quality. This custom has not been used to any extent in this country, as it has been almost conclusively proven that it injures the plant.

The cultivation was established at an early date in the vicinity of Cincinnati where it is still continued very extensively. The northern part of the State also claims recognition for its production as well as the valley of the Ohio, especially the counties of Jefferson, Belmont and Lawrence.

The age of the grapevines is not distinctly marked as in the case of many trees, but that they attain great age is an undisputed fact; for we have record of vines from one to four hundred years old. Pliny names a vine six hundred years old.

In the manufacture of wines the method adopted is very simple, but yet requiring much practical knowledge. The grape mostly used is the Catawba, but there are many others used, especially the Delaware and Concord. The Catawba grape does not ripen very early, but its excellence has given to its wines the high standing they hold. The bunches are above the medium, moderately compact, berries round, firm and of a deep red color, the skin thick, the flesh juicy and of a rich vinous taste. The Concord grape has large compact bunches, the berries round, large and black with a bluish bloom; the skin is thin, the flesh sweet, but somewhat acrid in the center. They ripen about two weeks earlier than the Catawba. The Delaware grapes as wine grapes deserve praise. The bunches are below the medium, very compact, the berry small, round and having a beautiful rose color, with a thin skin and a very sweet pulp. This variety ripens the earliest.

In the making of wine to obtain a good article care must be taken in the selection of the grapes. In gathering and assorting them the unripe and decayed ones are rejected and the ripe ones deprived of the stems. The grapes thus obtained are placed in a large hopper above two large wooden rollers, through which they are passed into a large vat below placed there for holding the crushed grapes. The crushing is done to break the skin and press the juice from the pulp, care being

used not to crush the seeds. Before expression the juice from the crushed mass is allowed to remain in the vat for about eighteen or thirty-six hours, during which time a slight fermentation has commenced. When this has continued a sufficient length of time the free juice is drawn off and the remaining mass is placed under a huge press for further expression. This is the white wine method and differs from that of obtaining the red wine only in allowing fermentation in the presence of the skins. The entire juice thus obtained is placed in large oak casks made for this purpose, holding from eight hundred to fifteen hundred gallons—one that I saw was of twenty-two hundred gallons capacity—which are filled to within two or three inches of the top the bung being put in loosely. The casks are kept in immense cellars at a temperature of about 15° C., which allows fermentation to go on quietly. At first the change is rather violent during which all the fibrous and inert matter settles to the bottom of the cask. This sediment is called “lees.” They contain but a small percentage of impure tartar so that they are of no value commercially and are thrown away as refuse.

The clear wine is drawn off or “racked,” which process consists of transferring the clear wine to another cask where after about three months standing this process is again gone over. This is done about three times during the first year, and it is from the second and subsequent “rackings” that we obtain the argols. During the continued fermentation of the new wine the gradual deposition of the insoluble portion takes place, consisting mainly of impure calcium tartrate and acid potassium tartrate. The yield is quite small when compared to the great bulk of wine for after about four months, the deposit is only enough to give the interior of the cask a crystalline appearance. These argols obtained are not used by the manufacturer for the reason of the small amount produced. On casks which have stood for years undisturbed the deposit is two or three inches in thickness, but owing to our native wine being sold when comparatively new no opportunity is given for such deposits.

The wine thus obtained is known as “dry wine,” and is that mostly sold as native wine. The same object is accomplished by bottling the “must” when first obtained, and after the required time has been allowed for the foreign matter to deposit on the side of the bottle the wine is transferred to another bottle and securely corked, age ripening its flavor. During the year 1881, 10,642 acres of land were under

cultivation, yielding 11,678,545 pounds of grapes, from which 884,895 gallons of wine was made. In 1882, 18,526,219 pounds were grown and 1,296,295 gallons of wine made.

I obtained from one of the largest wine growers in the State a sample of the argols from Catawba (white) wine and one from Concord (red) wine, which were estimated for the percentage of tartaric acid by the scheme given in "Allen's Commercial Organic Analysis." This consists of digesting an amount of the sample in powder, supposed to contain about 2 grammes of tartaric acid, with water until thoroughly softened. A strong solution of neutral potassium oxalate is next added in sufficient quantity to react with all the calcium salt present and leave an excess of about 1.5 gm. of the salt, and the mixture is heated, with frequent stirring, for some time. The solution, which generally is strongly acid, is carefully neutralized with solution of potash. After a little further heating the liquid—which should not occupy more than 40 cc.—is filtered on a small filter, the residue well washed and the washings concentrated and added to the main solution which is made up to about 50 cc. A strong solution of about 2 gm. of citric acid is added, the liquid being well stirred. After twelve hours the precipitate is collected and washed with a saturated solution of acid potassium tartrate, containing about five per cent. of potassium chloride. The filter and contents are removed to a beaker dissolved in hot water and treated with standard alkali. Each cc. of normal alkali equals .150 gm. of tartaric acid.

Three estimations of the red wine argols gave 51.57, 53.57 and 52.8 per cent., an average of 52.65 per cent. Three estimations of those of the white wine gave 69, 66.3 and 70.2 per cent., an average of 68.5 per cent. The white argols give 27.53 per cent. of ash and the red argols 16.43 per cent. The precipitate with potassium oxalate in the percentage estimation of the white argols gives 20.4 per cent. of ash, the red wine argols 10.18 per cent. A solution of the argols in hydrochloric acid shows the presence of potassium, calcium with a trace of magnesium and iron in that from white wine; that from the red wine only potassium and calcium.

Five samples of tartaric acid were next estimated. Three were of known make, one of these (No. 3) being in crystals, and two (Nos. 4 and 5) unknown. The samples known are from the leading manufacturing chemists and will thus give a fair estimation of the purity of the commercial article.

With a decinormal solution of soda number one gives 99.43 per cent., number two 99.42 per cent., number three 99.75 per cent., number four 99.50 per cent., number five 99.49 per cent., an average of 99.518 per cent. Number three was estimated twice. The Pharmacopœia requirement that "on ignition they should leave not more than .05 per cent. of ash" was next tried with the following results; Number one .08 per cent., number two .06 per cent., number three .07 per cent., number four .06 per cent., number five .06 per cent., an average of .066 per cent., thus being a little above the requirement. The result with number one being the highest, it was estimated twice thus giving confirmatory proof that the work was correct. Only a trace of moisture was found in three of the samples when heated to 100° C. until a constant weight was obtained.

The ash of all were found to be free from copper by treatment with a few drops of water of ammonia, nor on the addition of one drop of ammonium sulphide was lead or iron found. No precipitate was shown after five minutes on the addition of 1 cc. of test solution of barium chloride to 10 cc. of a concentrated solution of the acid with excess of hydrochloric acid, and after about ten minutes was any cloudiness noticed. The ash of number four was tinted brown, but did not given any reaction with water of ammonia or ammonium sulphide.

Summing up the above results commercial tartaric acid from reliable sources is certainly very pure, and with the exception of leaving a slight amount of ash more and falling a little below in its percentage of acid, fills the requirements of the Pharmacopœia.

Alveloz is the name of a plant which has been sent by the American Consul at Pernambuco to the State Department, with the statement that it belongs to the euphorbiaceæ, and that several cases of alleged cancer had been cured by its application. Unlike cundurango, which was an alleged internal remedy for cancer and syphilis, alveloz is an external application. Its mode of operation is similar to that of jequirity. A profuse suppuration follows its application to a granular surface. The drug was used in Washington by Dr. Smith Townshend in a case of lupus of the nose, which was of nearly forty years' standing, and had resisted all previous treatment. The ulcer was cured within a few days.—*N. Y. Med. Jour.*

NOTE ON DOVER'S SOLUTION.

BY A. B. LYONS, M.D.

The publication in your journal of a paper like that of E. H. Hess in your May issue, insures for the opinions therein stated a wide circulation, besides giving them a quasi endorsement. I therefore desire to criticise through your columns the concluding paragraph of the paper in question.

The writer states that he has made some physiological experiments upon a cat with the familiar combination of morphine and ipecac which, in a new form, is the subject of his thesis, finding that in overdoses it "produced emesis with general exhaustion, but no alarming symptoms." From these experiments he concludes that the Dover's solution is "almost a harmless preparation, as an overdose is almost certain to produce emesis." I need not point out the importance, in drawing conclusions from physiological experiments, of keeping well in mind the fact that different animals are affected in very different ways, and in very different degrees by toxic agents. A mixture containing in each fluidounce six grains of morphine acetate and the equivalent of *four grains* of ipecac might be an emetic for a cat, but I should be very greatly surprised to find it capable of producing any such effect in a human subject. It must be remembered that the effect of morphine is to counteract powerfully the action of ordinary emetics, and ipecac alone in a dose of as much as four grains would not generally do more than to produce slight nausea.

We have already too many preparations of opium of varying strength. That now proposed agrees very well in morphine strength with the fluid Dover's powder (tincture of ipecacuanha and opium) of the U. S. Pharmacopœia and with the other officinal tinctures of opium, but the relative proportion of ipecac is very much smaller than in any of the numerous formulas in general or local use.

If we must have a second form of fluid Dover's powder, let us at least have the composition and the dose the same as that of preparations already recognized by our standard authority.

Detroit, Mich., May 27, 1885.

FOR FIXED DRESSING FOR JOINTS, requiring rest, Dr. Levis uses the following, which is painted over roller bandages or cloth, applied to the part : Glue, lb. i. ; oxide of zinc, lb. ss. ; water, Cong. ss.—*Coll. and Clin. Record.*

ON SOME USEFUL PLANTS OF THE NATURAL ORDER
OF VERBENACEÆ.

BY JOHN M. MAISCH.

Read before the Pennsylvania Pharmaceutical Association, June 3, 1885.

A comparison of the drugs recognized by the Pharmacopœia of a foreign country with those admitted into the Pharmacopœia of the United States frequently reveals the fact that certain plants indigenous to or commonly cultivated in both these countries may have been deemed of sufficient importance for official recognition in one, while they are little used in the other. Such a comparison very naturally invites also to a closer inquiry into the usefulness of other plants which are botanically allied to those yielding officinal drugs. Among the pharmacopœias which have been published during the past few years, those of France (*Codex medicamentarius*, Paris, 1884) and of Mexico (*Nueva Farmacopea Mexicana*, Mexico, 1884), are the most comprehensive in having admitted numerous drugs of vegetable origin which are comparatively unknown here. Inquiries in the direction pointed out before show that, in many cases, these drugs are the representatives of a much larger number derived from plants of the same natural order which were formerly employed in medicine, or are in popular use in their native countries as medicinal agents; and that in the same order other plants are found which are more or less valuable in the arts.

In laying before you some of the results of my inquiry, a natural order has been selected which has thus far not yielded any drug possessing very important medicinal properties, but which, nevertheless seems to be deserving of some attention, inasmuch as a number of the plants are very commonly cultivated for ornamental purposes, while a limited number of mostly homely weeds are indigenous to our country.

The natural order of verbenaceæ comprises in the neighborhood of seven hundred species, which are mostly indigenous to tropical countries, only few species being at home in the temperate zones. The tropical species are mostly trees or shrubs, and are frequently aromatic, while the species of temperate climes are usually herbaceous and not fragrant, at least not to the same degree as many of those growing in the tropics.

One of the most important species is the East Indian *teak tree*, *Tectona grandis*, *Lin. fil.*, which grows in Hindoostan, Siam and the

Malayan Islands, attaining a height of over eighty feet, and a thickness of more than four feet. The oval or elliptic and entire leaves are two or three feet long, and are said to be useful for polishing wood owing to their roughness; they have an acidulous astringent and bitterish taste, and are employed for their mild astringent properties, and as a purple dye. The small white flowers are fragrant, and are believed to possess diuretic properties. But the most valuable portion is the wood which on account of its hardness and durability is largely used in ship-building, and in the East also for temples and dwellings. It is of a light brown color, resinous, porous, yet heavy, a cubic foot of it weighing from forty to fifty pounds; it is nearly indestructible in water, is not attacked by worms, and far excels the best oak wood in durability. According to G. Thoms, the air dry wood yields 2.15 per cent. of ash, consisting chiefly of calcium phosphate and silica. The African teak, which is likewise valuable for its timber, is a euphorbiaceous tree, *Oldfieldia africana*.

Gmelina arborea, *Roxburgh*, is likewise an East Indian tree, the root of which has been employed in gout, and the bark in intermittent fevers. The smaller species *Gmelina parvifolia*, *Roxburgh*, and *Gm. asiatica*, *Lin.*, possess demulcent properties, the leaves and the root being employed.

Avicennia tomentosa, *Lin.*, a medium sized resinous tree, has also a mucilaginous root, while the unripe fruit has been employed as an emollient cataplasm. The allied *A. nitida*, *Jacquin* is known in the West Indies as *black* or *olive mangrove*; the bark is called *courida bark*, and is used in tanning.

Clerodendron infortunatum, *Lin.*, is an East Indian shrub, the leaves and root of which are employed externally for tumors and certain skin diseases, and internally as tonics. The root of *Clerodendron inerme*, *R. Brown*, is of a more decided bitter taste and strong odor, and is regarded as possessing tonic and alterative properties, and as being useful in venereal and scrofulous complaints.

Of the genus *Vitex*, popularly known as *chaste-tree*, two or three shrubby species are not unfrequently cultivated in this country, namely, *V. Negundo*, *V. incisa* and *V. Agnus-casti*, *Lin.*, the former two being indigenous to Asia, the last one to the basin of the Mediterranean. This is about ten feet or more high, has opposite ascending brownish gray or greenish, obtusely quadrangular downy branches and palmate, on the lower side downy leaves with five or seven lanceo-

late acute and entire leaflets; the bluish, purplish or whitish fragrant flowers are in sessile clusters at the end of the branches, forming an interrupted spike ten inches or more in length; the fruit is globular, blackish-brown, of about the size of black pepper, four-celled and four-seeded, and has a rather strong aromatic, somewhat narcotic odor, particularly when rubbed, and a peppery taste. The leaves are likewise pungent, and were formerly employed in many diseases as a stimulant and irritant; the fruit, however, was more frequently used for similar purposes, also as a spice in place of pepper, under the incorrect name of *semen agni casti*. Landerer (1835) found in the fruit a volatile principle, acrid and acid oil and a crystalline principle of a bitter taste, soluble in alcohol and partly soluble in acetic acid, which solutions are precipitated by alkalis and by tannin. The principle has been named *viticin* and *castin*, but its true nature has not been determined. The other species of *Vitex* are likewise somewhat stimulating; those of the West Indies and others are arboreous, some of them being valuable for timber. The fruit of *Vitex trifolia*, *Lin.* is called in India *wild pepper*.

The genus *Lantana* of tropical America is well known in our gardens and represented by a number of species bearing bright-colored showy flowers, which often change in color before they fade. Thus the prickly *L. Camara*, *Lin.*, a native of the West Indies and of South America, northward to our Gulf States, has deep golden yellow flowers, changing to orange color and scarlet. *L. nivea*, *Ventenat*, in some of its varieties changes its white flowers to blue. *L. mixta*, *Lin.*, like the preceding species indigenous to Brazil, has also white flowers the color of which passes through different shades of yellow and orange to red. Many hybrids have been produced by gardeners from these and other species, and are characterized by the striking mutation of the color of their flowers. The herbaceous portion of the lantanas is more or less agreeably aromatic, and is popularly employed in the native countries of the different species for its sudorific action and externally in fomentations and cataplasms. In addition to the species mentioned, *L. odorata*, *Lin.*, *L. involucrata*, *Lin.*, and *L. trifolia*, *Lin.*, may be enumerated which with others are known in the West Indies as *wild sage*. *L. Pseudo-thea*, *Saint-Hilaire*, is probably the most important species, it being used in Brazil in place of Chinese tea, but whether it also contains theine has not been ascertained; the plant is known in

Brazil as *capitão da matto* (Bentley), and as *chá de frade*, or *chá de pedestre* (Peckolt).

The widely distributed *Lippia* (*Zapania*, *Lamarek*), *nodiflora*, *Richard*, is a procumbent or ascending perennial with small whitish, yellowish or reddish flowers, possesses mild aromatic and tonic properties, and has also been employed as an antispasmodic and against snake bites. It grows in most tropical countries and is frequently met with in our Southern States in damp localities. It is known as *fogfruit* like the closely allied *Lippia lanceolata*, *Michaux*, which is a weed extending northward into Pennsylvania, Ohio and Illinois, and westward to Colorado.

The so-called *lemon verbenæ*, *Lippia* (*Aloysia*, *Ortega*), *citriodora*, *Kunth*, s. *Verbena triphylla*, *L'Heritier*, is a well-known ornamental shrub of our gardens and conservatories, indigenous to Peru and other parts of South America. In Mexico it is officinal under the name of *cedron*, and in France as *verveine odorante*, also known as *verveine-citronelle*. *Oliva* who examined the plant found in it, besides volatile oil, the usual common constituents of plants like sugar, gum, fat, tannin and coloring-matter. It is employed as an antispasmodic.

Dr. Podwissotzki ("Phar. Zeitschr. Russl.," 1883, p. 920) has submitted the herb of *Lippia mexicana* to analysis, and obtained tannin, a quercetin-like crystalline principle, liquid volatile oil of a lemon-like odor, and *lippiol*, a camphor melting between 25° and 30°C., having the composition of menthol, and representing the medicinal activity of the plant; it acts as a diaphoretic, nauseant and soporific. I have not had the opportunity of consulting the paper referred to as originally published, but have seen only abstracts of the same. On examining several works on Botany, general, as well as specially referring to Mexico, I was unable to find a plant of the name given by Podwissotzki. A plant having a strong somewhat lemon-like odor is *Cedronella mexicana*, *Bentham*, which has been admitted into the Mexican Pharmacopœia under the name of *toronjil*, it being used as an antispasmodic; its volatile oil is similarly employed and also as a perfume. It seems likely that Podwissotzki's researches have reference to this plant (which belongs to the natural order of Labiate) or to *Aloysia citriodora*.

The Mexican Pharmacopœia has admitted, under the name of *yerba dulce*, two indigenous species of *Lippia*, *L. graveolens*, *Kunth*, and *L. duleis*, *Treviranus*, which are used in the form of infusion for their

demulcent, pectoral and emmenagogue properties. The first-named species has oval-oblong leaves, which are rounded or somewhat heart-shaped at the base, finely hairy above and white velvety beneath. The leaves of the second species are membranous, oval or deltoid, acute, serrate, prickly, rough above and pubescent beneath. The odor is strong, somewhat resembling wormwood; the taste is refreshing and at first piquant, afterwards mild. Rio de la Loza ("Union Med. de Mex.," i, 1857) found in the plant a sweet principle, volatile, and soluble in water and alcohol, a volatile oil, a stearopten resembling camphor, etc

It will be observed that in properties and constituents these plants resemble some of the labiatae, and other Mexican species of the same genus are probably equally aromatic or more so, and are employed in the place of some of our labiate plants. Thus the common name of *salvia poblano* or *salvia real de Puebla* is applied to *Lippia callicarpifolia*, Kunth, which species is regarded as the Mexican substitute of the sage of our pharmacies. Another species, *Lippia origanoides*, Kunth, which is known in Mexico as *origano*, and by the Mexican Pharmacopœia is stated to be a substitute for our common *origanum*.

The verbenas proper are well represented in our gardens as ornamental plants by a large number of varieties and hybrids produced from about half a dozen species, of which *Verbena Aubletia*, Lin., is indigenous to North America, from Virginia and Illinois southward, and westward to the Rocky Mountains, and is reputed to possess acrid and mucilaginous properties. The other cultivated species were introduced from Brazil and other parts of South America about 50 or 60 years ago, and in part at least are employed in their native countries as diaphoretics and emmenagogues. *V. erinoides*, Lamarck, *V. teucriifolia*, Martius, *V. multifida*, Ruiz, *V. chamædrifolia*, Jussieu, *V. teucrioides*, Hooker, *V. phlogiflora*, Cham., and others contribute to these ornamental plants, which are valued for their bright or delicate colors.

V. officinalis, Lin., is a European weed, somewhat naturalized in this country, with pinnatifid leaves, and small reddish or purplish flowers, inodorous, bitterish and somewhat astringent. It possesses mild stimulant, tonic and astringent properties, and is still recognized by the French Codex as *verveine officinale*; also by the Pharmacopœia of Mexico, though in the latter country in place of it *V. caroliniana*, Lin., is generally employed, which possesses similar properties, and is common in dry soils in our Southern States. It grows to the height

of about 20 inches, has obovate, crenately dentate sessile leaves, and rather large rose-colored flowers in loose terminal spikes. The inodorous *Verbena ciliata*, *Bentham*, is used in Mexico in the place of hyssop.

Among the North American species the handsome blue flowering *Verb. bracteosa*, *Michaux*, has the reputation of being useful in scrofulous complaints; the homely blue vervain, *V. hastata*, *Lin.*, has been employed in fevers, and in large doses acts as an emetic; and the coarse-looking white vervain, *V. urticifolia*, *Lin.*, is reputed to be useful in various complaints, and is employed as a topical application in poisoning by *Rhus Toxicodendron*.

In some of the West Indian islands and in Central America *Stachytarpha* (*Verbena*, *Lin.*) *jamaicensis*, *Vahl*, is known as verbena, from which genus it differs mainly by its four-toothed calyx, by two barren and two fertile stamens, and by the two-parted fruit. The plant is somewhat woody, 2 or 3 feet high, has elliptic or ovate sharply serrate leaves, and produces slender spikes of small blue flowers sunk in furrows of the thickened rhachis. Like other allied plants, it is popularly used in a variety of diseases, but seems to be most useful as a diaphoretic and tonic. It is likewise used in Brazil, and, with one or two allied species, is known there as *jarbáo* and *urgeváo*.

The above notes show that the plants of the natural order of Verbenaceæ possess tonic and stimulant properties, and that those growing in tropical or subtropical countries are frequently aromatic, and some of them acrid. Considering the fact that the species of the temperate climates are destitute, or nearly so, of aromatic properties, and contain bitter and astringent principles only to a limited extent, it is not surprising that they are apparently not possessed of any decided medicinal virtues, and that they have received but little attention from the pharmacist and still less from the chemist; but it is likely that many of those growing in warmer climates may open an interesting field for chemical research on the nature of their volatile oils, their bitter or acrid principles, their tannins, and possibly other constituents.

PILOCARPUS IN URTICARIA.—Obstinate urticaria is reported by M. Guineau de Mussy to be cured by R pulv. pilocarpi, ext. guaiaci a a gr. 2, lithii benzoatis gr. 3, m. ft. pil. Two pills, gradually increased to four pills, are administered daily, combined with sulphur baths.—*Pacif. Med. and Surg. Jour.*, April, 1835.

GLEANINGS FROM FOREIGN JOURNALS.

BY J. ROBERT MOECHEL.

Detection of HNO_3 , HNO_2 , and HNO in concentrated H_2SO_4 .—A very convenient and delicate test for the above is ferrous sulphate, precipitated by means of alcohol from the watery solution, which when dried is a whitish coarse powder. Put into a test tube, about 1 cm. in width, 3 cc. of the colorless sulphuric acid, add a pinch of the white ferrous sulphate, and shake; the salt floats in small particles, the acid remaining colorless and the salt white, even on heating. In the presence of slight traces of nitrogen acids the acid assumes a reddish violet color, or the white salt particles take immediately a violet-gray color. Hager states that this test is more delicate than the test given by the German Pharmacopœia, and easier to execute.—*Ph. Centralhalle*, 1885, p. 141.

A new reagent for the detection of albumen is given by Prof. Dr. Axenfeld, who observed that auric chloride (AuCl_3) gives very characteristic colorations with albuminoids. Add to a solution of albuminoids a little formic acid and AuCl_3 (1:1000) and warm; gas bubbles arise, and the solution assumes a rose color; a further addition of AuCl_3 gives a purple, bluish or deep blue color, and a large amount causes a blue flocculent precipitate, the liquid becoming clear like water.—*Central Bl. Med. Wiss.; Chem. Ztg.*, 1885, No. 32.

Carvol.—Freshly made oil of caraway does not contain a phenol, giving, therefore, no coloration with ferric chloride; but the oil in the course of time, say one year, gives that coloration.

To deprive carbon bisulphide and kerosin of the disagreeable odor, mixing with oil or fat and careful redistilling is recommended.

Cornutine and Ergotinine.—According to M. Tanret, Kobert's cornutine ("Am. Jour. Phar.," 1885, p. 170) is more or less changed ergotinine.—*Jour. Phar. Chim.*, 1885, p. 6.

Remedy for Tapeworm.—De Vrij recommends the following, which is stated to yield a uniformly successful preparation: Dry pomegranate root bark is macerated and exhausted with cold water, and the liquid is evaporated to a powdery extract, which should be kept in a well-corked bottle. The dose of this is 4 Gm., divided in 8 packages, and taken, on an empty stomach, every quarter of an hour. To the last package 0.10 Gm. ($1\frac{1}{2}$ gr.) of calomel is added. Soon the living tænia makes its appearance, and should be seized by the patient or an assistant to extract it entirely.—*Jour. de Phar. d'Anvers*, 1885, p. 59.

Antiseptic.—G. Sternberg recommends a solution of 2 Gm. of corrosive sublimate and 2 Gm. of potassium permanganate in 1 liter of water. The advantages are: 1. The poisonous liquid is colored. 2. The antiseptic effect of the sublimate is combined with the deodorizing action of the permanganate.—*Monatsh. f. Dermat.; Ph. Centralhalle*, 1885, No. 10.

Iodoform Pencils.—Triturate cacao butter with a warmed pestle, and mix well with iodoform until a somewhat soft mass is obtained, which is put into a tin syringe, and by slow pressing formed into sticks of convenient length.—*Phar. Ztg.*, 1885, No. 29.

Gelatin Bottle-Capping.—Soak 7 lbs. of Russian gelatin in a mixture of 10 oz. of glycerin and 60 oz. of water, until it is thoroughly softened; then heat in a water-bath, to liquify, and add a few drops of a watery solution of any aniline color. The capping sets quickly, and should be used while hot.

Maraschino di Zara.—Alcohol (90 per cent.) 2 liters, distilled water $1\frac{3}{4}$ liters, triple orange-flower water 80 Gm., vanilla tincture 20 Gm., bitter almond water (concentrated) 30 Gm., aromatic tincture 10 Gm., simple syrup 900 Gm. The flavor depends upon the quality of the ingredients used.

Enamel Labels.—Mix copal or dammar varnish with sufficient oxide of zinc, and paint therewith.—*Ph. Ztg.*

Turtle Oil from the *Seychelles* is obtained from the greenback turtle, *Chelonia mydas*, by boiling the fat. Mr. J. H. Brooks informed Mr. E. M. Holmes that for some twenty years he has used turtle oil with the most beneficial results in all cases where cod liver oil was indicated, and that it is administered in the same doses as the latter. As much as ten gallons of oil are sometimes obtained from a single turtle, and it could be supplied in very large quantities if a demand should arise for it. Its color and non-drying properties render it admirably adapted for pomades, for which an animal oil is generally considered to be preferable to a vegetable one.

Turtle Oil from Jamaica is used in a similar manner and is prepared from the flesh of the back of the trunk turtle, probably *Chelonia Caouana*. A sample of oil received by Mr. Holmes was not quite as palatable as the preceding. Both oils are yellowish and at the ordinary temperature form a thick, finely granular fluid, resembling in consistence partly congealed olive oil.—*Phar. Jour. and Trans.*, Jan. 17, 1885, p. 573.

KERATIN-COATED PILLS.

BY DR UNNA.

Dr. Unna, of Hamburg, has discovered a coating for pills, which is likely to prove even more useful than it is ingenious. The task which he set himself was to find a coating which would resist the solvent action of the gastric juice, but would dissolve in the small intestine. This he has succeeded in doing by the use of keratin, a substance extracted from the shavings of ox or buffalo horn. The shavings are first digested by artificial gastric juice (pepsin solution with 1 per cent. hydrochloric acid), and are then macerated for weeks in ammonia. When the ammonia is driven off, a gummy solution of keratin is left, from which, by drying, keratin is obtained in the form of shining, bright, yellow flakes.

A pill which is to be covered with keratin requires to be prepared in a special manner. The medicine employed is first rubbed well up with cacao butter or tallow, with the addition of some indifferent powder, if necessary, and pills are made. The pills are then covered with cacao butter, so as to prevent any of the medicine from being on the surface of the pill. When the pill is hard it receives one, or, better, two or three coatings of solution of keratin. If the substance of which the pill is made renders solution in ammonia inconvenient, a solution in glacial acetic acid may be used. Keratin-coated pills are insoluble in the gastric juice, but dissolve as soon as they enter the small intestine, and have, therefore, a special value in cases in which medicines which have an irritating effect on the mucous membrane of the stomach are to be administered for any length of time; for example, when arsenic, salicylic acid, kreosote, copaiva, cubebs, tartar-emetie, and vermifuge medicines are prescribed.

The method is further useful when medicines are given which are affected by digestion in the stomach, forming insoluble precipitates with pepsin and peptones; for example, tannin, alum, acetate of lead, subnitrate of bismuth, nitrate of silver, bichloride of mercury, etc.; and, further, in the case of medicines which it is desired should enter the intestine in as concentrated a form as possible, and medicines which are given with the view of affecting favorably diseased conditions of the mucous membrane of the stomach without exercising an irritating local action; for example, iron, quinine, arsenic in catarrh of the stomach arising from ammonia.—*British Medical Journal; Jour. Am. Med. Assoc.*, April 4, 1885.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from p. 280.)

Ancusa, *Anchusa tinctoria*, *Lin.*; the root is used for coloring pomades.

Angélica, the root of *Angelica Archangelica*, *Lin.* Dose, in powder, 5 to 10 gm.; the infusion, 15 gm. to one liter of water.

Angostura verdadera, the bark of *Galipea officinalis*, *Hancock, etc.* Dose of powder, 2 to 4 gm.; of extract, 0.5 to 1.0 gm.; little employed.

Anís comun and *Anís estrellado* are Anise and Star-anise.

Anisillo cimarron, *Schkuhria abrotanoides*, *Roth*, a Mexican composite, is anti-spasmodic.

Anona reticulata and *A. glabra*, *Lin.*, Mexican custard apple. The fruit is edible; the decoction of the bark, leaves and green fruit is reputed to be astringent and used in diarrhœas; the infusion of the leaves is anti-spasmodic; the powder of the seed is employed as an insecticide and is dangerous.

Añil, Indigo, is little used medicinally.

Apio, Parsley, is aperitive and used in infusion of 15 to 30 gm. to the liter.

Árbol de la cera, *Myrica jalapensis*, *Kunth*, nat. ord. *Myricaceæ*, is indigenous to the sierra of Huauchinango. The wax obtained from the fruit by boiling with water is green or yellow, according to the method of extraction, more brittle and unctuous than bees' wax, has a feeble odor, a slightly bitter taste and a density nearly equal to that of water and melts at 43°; but on exposure the fusing point rises to 47.5°. It is wholly soluble in boiling ether, insoluble in water, sparingly soluble in cold alcohol and dissolves in 20 parts of boiling alcohol, depositing the greater part on cooling; alkalies saponify it readily. It has probably the same composition as myrtle wax from *Myrica cerifera*. It is given internally in powder against diarrhœa and jaundice, and is used for making candles, for adulterating bees' wax and as a substitute for the latter in pharmaceutical preparations. The bark of the root is acrid and astringent, and in larger doses emetic.

Árbol de los manitas, *Cheirostemon platanoides*, *Humb. et Bonpl.*,

nat. ord. Bombacæ, indigenous to Mexico. The flowers are used internally in epilepsy, and as an emollient in ophthalmia.

Árbol del Perú, *Schinus Molle*, *Lin.*, nat. ord. Terebinthacæ, grows in various parts of Mexico. The leaves, masticated, serve as a remedy for loose teeth and atonic ulcers of the mouth. The fruit, known as *Pimienta de América*, is stomachic, stimulant and diuretic; it contains a notable quantity of sugar and may be used for the production of alcohol and vinegar. The bark has astringent and balsamic properties. The gum-resin was examined by Manuel C. Jimenex, of Mexico; it forms milk-white tears, varying in size and becoming gradually reddish yellow, softens on mastication, has a bitter and sharp taste with an aftertaste resembling that of cubeb, and a disagreeable odor, becomes soft at 35° and melts at 40° giving off white fumes and an odor like frankincense. Its powder is dingy white and is easily emulsionized with water. It is composed of 40 gum, 60 resin and a small quantity of volatile oil. Two or three drops of the concentrated emulsion are used for the removal of spots on the cornea.

Aristolochia larga and *A. redonda*, the rhizomes of the European *Aristolochia longa* and *A. rotunda*, *Lin.*, are rarely employed as tonics and stimulants.

Arnica montana, *Lin.* The root, leaves and flowers are employed; however, *Heterotheca inuloides*, *Cassini*, is frequently substituted for the former. The ray florets are pistillate, the receptacle flat and alveolate, the involueral scales imbricate and linear, the akenes of the ray oblong and smooth, those of the disk cuneiform and downy, the lower leaves petiolate oval and dentate, and the upper ones sessile, lanceolate and entire. The chemical constituents and the therapeutic action of this plant have not been investigated.

Aro, *Richardia æthiopica*, *Kunth*, nat. ord. Aracæ. The plant is very acrid in the fresh state, the juice caustic, the leaves and root vesicating.

Aroma, *Acacia Farnesiana*, *Willd.*, nat. ord. Leguminosæ; indigenous to Yucatan. The fruit is astringent and yields an extract known as *jugo de acacia* and having the same properties as catechu. The flowers are very fragrant, have anti-spasmodic properties and are much used in perfumery under the name of *casia* or *cassie*.

Arrayan, *Myrtus Arrayan*, *Kunth*; indigenous to Mexico. The

leaves contain a volatile oil and are used as a perfume; they are astringent and, like the bark, are used for tanning.

Arrowroot (the fecula of different plants), Arroz (rice), *Artemisia vulgar* (mugwort), *Asafetida*, *Asfalto* (asphaltum), *Azafran* (saffron), *Azafrancillo* (safflower), *Azúcar de caña* (cane sugar) are enumerated.

Artemisia del país, *Ambrosia artemisiæfolia*, *Lin.*, the hog-weed or rag-weed, common also in the United States, is used as a stimulant and emmenagogue, and is reputed to be febrifuge and anthelmintic. Dose, in powder, 2 gm.; of the extract, 0·5 to 1·0 gm.

Atlanchana, *Cuphea lanceolata*, *Kunth*, nat. ord. *Lythraceæ*; indigenous to Mexico. The stem is herbaceous, striate, pubescent and viscidous; the leaves are opposite, short-stalked, lanceolate and somewhat downy. In Puebla the plant is used by midwives as a corroborant after childbirth. The bruised fresh herb or the tincture of the dry plant is employed, after baths, as an embrocation of the back and hips. The drug is considered to be mildly astringent and anti-dysenteric.

Azafrancillo de Mexico, *Escobedia scabrifolia*, *Humboldt*, nat. ord. *Scrophulariaceæ*, grows in the State of Guerrero. According to Dr. Altamirano (*La Naturaleza*, III, 390), the root contains the crystalline principle *escobedin* and the resinous coloring matter *azafranin*, the latter producing with sulphuric acid a blue color, changing to violet. It is used for coloring.

Bálsamo de copaiba, *Copaiba*. Brazilian and Maracaibo copaiba are used.

Bálsamo de liquidámbar, Sweet gum, from *Liquidambar styraciflua*, *Lin.*, growing in the State of Vera Cruz and other parts of Mexico. The crude balsam has the consistence of turpentine, is of a gray color mixed with darker pieces and with white tears, has a strong, not unpleasant odor and a bitter warm and acrid taste, and contains fragments of bark and other impurities. It is purified by warming and straining and is then more or less transparent, whitish gray or yellowish and becomes thicker and darker on keeping. In regard to its composition, the older investigations by Bonastre, Hanbury and Creecy are mentioned, but not the more recent ones by Harrison and Flückiger. The balsam is sometimes adulterated with turpentine, and an inferior, dark colored and opaque balsam is prepared by boiling the branches with water. It is used as a balsamic stimulant in doses of 0·5 to 2·0 gm.

Bálsamo negro, Balsam of Peru. It is stated that *Myrospermum Percire*, *Royle*, grows in Pánuco, Huajicori, Cuautla de Morelos and in other warm sections of the Republic as well as in Central America, and that the fruit and bark of the indigenous tree are also employed. The fruit, which we have seen in 1876 and of which we have recently received specimens from Prof. Alfonso Herrera, resembles that of *Toluifera Balsamum*, *Lin.*, as figured by Bentley and Trimen, and differs in shape from that named above; of the latter we have specimens from the late Prof. Carson, which he received from Dr. Dorat, and these agree with Bentley and Trimen's figure of the same species. It is known that Prof. Baillon considers these plants as one variable species. The tree does not appear to be used in Mexico for the production of balsam.

Bálsamo de Tolú (Tolu balsam), Bardana (Burdock), Bedelio (bdellium), Beleño blanco and B. negro (*hyoscyamus*), Belladona (*belladonna*), Benjuí (*benzoin*), Bistorta (*bistort*), Bol de Armenia (Armenian bole), Brusco (butcher's broom), Buchu, and Buglosa (*Anehusa officinalis*) are enumerated among the drugs.

COMMERCIAL TANNIN.¹

BY T MABEN.

It has frequently been the subject of remark that the tannin of commerce varies considerably in quality, and I have recently examined a number of samples with the object of ascertaining within what limits the variation may be said to extend. Of those who have already drawn attention to the question may be cited Mr. H. R. Proctor, who states that "the tannin met with in commerce contains only 80 to 90 per cent. of really pure tannin;"² Mr. A. H. Allen, who writes in corroboration of this, that some of the samples he examined contained "30 to 40 per cent. of inert matter as indicated by the lead process;"³ and Sutton, who says that "commercial tannin often contains 20 per cent. of impurities."⁴

My aim in taking up the subject was mainly to determine, if possible,

¹ Read at an Evening Meeting of the "North British Branch of the Pharmaceutical Society," April 8, 1885.

² "Pharm. Journal, [3], vol. vii, p. 1020.

³ *Ibid*, p. 1057.

⁴ "Volumetric Analysis," 4th edition, p. 279.

the percentage of tannic acid in the tannins, and with that view I procured nine samples from different sources. The samples are those of London, Edinburgh, and German manufacturers in almost equal proportions, and may therefore be taken to be fairly representative. I may remark in passing that a number of so-called makers do not in reality manufacture or extract the tannin, but simply confine themselves to the *purification* of the German product.

It may be of advantage, before referring to their composition, to note the physical characteristics of the samples. In general appearance they vary considerably, some being crystalline or scaly, Nos. 1 and 5 especially so, while others are almost destitute of scales. They are for the most part of a light yellow or pale straw color, one only, No. 1, being of a perceptibly darker shade. The variation in weight is very remarkable, some of the samples being extremely light while others are comparatively heavy. The specific gravity of the samples was not taken, but their relative weights were roughly determined; from these it will be seen that as a rule the weight bears a striking relation to the percentage of tannic acid, viz., the lighter the tannin the higher the proportion of tannic acid content.

The solubility of tannin is variously stated, the range being from 1 in 0.8 of water to 1 in 6. I have not attempted more than an approximate determination of the solubility of the different samples, so that the figures given must not be assumed to be definite. So far as I have gone, the solubility seems to bear no relation to the percentage of tannic acid.

It is frequently of practical value to know the time required for a given quantity to dissolve, and with the view of ascertaining this, 10 grains of each sample were shaken up with one ounce of distilled water at 60° F. No. 1 dissolved in half a minute, 5, 6, and 8 in two minutes, 2 and 9 in three minutes, while 3, 4, and 7 were only partially dissolved at the expiration of fifteen minutes. The residue in 3 and 4 dissolved at once on the solutions being heated to 80° F., while that in No. 7 still remained undissolved. The aqueous solutions presented points of contrast that are interesting. Nos. 2, 5, 6, and 8 were perfectly clear, 3 and 4 were slightly muddy, 1 and 9 still more so, and 7 most of all. On heating the muddy solutions to 80° F., the opacity almost entirely disappeared from 3 and 4, but not from 1, 7 and 9. The insoluble matter in No. 7 was of a resinous nature; the proportion being very small it was not estimated.

All the samples were soluble in rectified spirit. No. 2 disappeared almost instantaneously, 1, 5, 6, and 7 very rapidly, and 3, 4, 8, and 9 somewhat slowly. When diluted with an equal bulk of water all the solutions remained perfectly clear.

The samples were also soluble in glycerin. Employing the proportions for glycerinum acidi tannici, at a temperature of 60° F., it was found that No. 1 dissolved in about three hours, and No. 5 in four hours. All the others were more or less undissolved at four hours, but when placed in a bath of hot water they dissolved in a very few minutes.

Tannic Acid.—In coming to the consideration of the composition of the samples, I may refer to the uncertainty of our chemical knowledge of the tannins in general, and of the gallotannic acids, as commonly met with, in particular. It would be out of place for me to attempt to summarize the different opinions that prevail regarding gall tannin, but it does not seem as yet to have been determined whether it is or is not a glucoside, and if a glucoside, whether of gallie or digallie acid.

The researches of Paul and Kingzett¹ led them to the conclusion that the gallotannic acid of commerce was not a glucoside, and, further, that "the supposition that tannin, as it exists in gall nuts is a glucoside is rendered doubtful, and the sugar met with in some samples of tannic acid is more probably referable to an impurity, as Rochleder and Kawalier assumed. Schiff leans to the opinion that the tannin in gall nuts is a glucoside, but he states that the gallotannic acid met with in commerce is not a glucoside, but digallie acid."

This uncertainty, coupled with the extreme difficulty of procuring pure gallotannic acid, has always been a barrier in the way of analytical, and especially gravimetric methods for its estimation. A large number of methods have been proposed, but most of these are, according to competent authorities, more or less faulty. Proctor, in the paper already quoted, gives a decided preference to Löwenthal's volumetric method, and Dragendorff,² after summarizing the more important processes and indicating precisely the strong and weak points of each, also seems to prefer the permanganate method. My own experience of the gravimetric methods has been that I found a difficulty in obtaining concordant results, and these, moreover, were generally too high, which is doubtless to be accounted for by the varying composition of the precipitates, and the liability of the tannin and its salts to undergo decom-

¹ "Journ. Chem. Soc.," vol. xxxiii, p. 217.

² "Plant Analysis," pp. 41-46.

position during the process of manipulation. These disadvantages are, if not entirely obviated, at all events lessened in the method by Löwenthal, and as this, in the present state of our knowledge, may be regarded as the most satisfactory, I have employed it in the estimation of the tannic acid.

The working details of the process are given very fully by Sutton, and for these it is only necessary for me to refer to his standard work. That there are difficulties in the actual carrying out of the process is undeniable, the most formidable of these being the uncertainty of the end-reaction and the doubt as to the exact amount of correction required for the gelatin. Sutton directs the permanganate to be delivered in very slowly with constant stirring "until a faint rose color appears round the edges of the liquid," while Dragendorff says the solution is to be run in "till the blue color changes to green." It will be found in actual practice that the rose color is considerably distant from the green, and as everything depends on knowing exactly when to stop it must be admitted that in this respect the process is not yet perfect. I found that it was necessary, in order to get good comparative results, to run in permanganate solution till the color, a faint yellow, was as nearly as possible identical with that of a standard solution kept side by side with the liquid being titrated. Authorities also differ as to the correction required for the gelatin. Proctor, quoted by Sutton, says that "probably the nearest approach to the truth may be obtained by deducting half the correction for gelatin from the oxidizable matter other than tannin," whereas, according to Dragendorff, "the addition of gelatin as described by Löwenthal introduces only a slight source of error which may be generally neglected." As to the latter statement, it is obvious that if only comparative results are required, the error may be neglected, provided always that a carefully standardized gelatin solution be employed, but if even approximately correct figures are wanted, it is absolutely necessary that the correction for gelatin be made. I am also decidedly of opinion that Proctor is within the mark when he deducts only half the gelatin correction, and prefer rather to go to the other extreme by deducting the whole. This I have done in these estimations, and consequently it is just possible that my results as regards the percentage of tannic acid may be rather high.

Having ascertained the quantity of permanganate required for oxidation, the calculation of the results is readily accomplished. For this purpose I have used the coefficients of Neubauer and Oser, as given

by Sutton, according to whom, one gram of pure gallotannic acid requires for oxidation 0.759 gram $K_2Mn_2O_8$. It is somewhat unfortunate that authorities are not agreed as to the value to be assigned to the permanganate. Dragendorff, on Gunther's authority states that "16 parts of oxygen from the permanganate oxidize 32.5 parts of gallotannic acid." Even if we assumed that the $K_2Mn_2O_8$ parted with all its oxygen for this purpose we would still find that 0.759 gram only represents 0.62 gram acid, in other words, that Gunther's value is, at the very utmost, only five-eighths that of Neubauer's. Too much stress need not be laid on these differences, however, as the method of procedure adopted may sufficiently account for the discrepancies, and admitting that the actual value of the permanganate has not yet been ascertained, there can nevertheless be no doubt that as a comparative test for the same class of tannins Löwenthal's process is unexceptionable.

Organic Matter other than Tannic Acid.—The percentage of oxidizable matter other than tannic acid can of course only be taken by difference, a method of which the disadvantages are peculiarly evident in the case of tannin. The application of Mr. Young's cyanide of potassium test,¹ assuming it to be correct, showed that all the samples contained traces of gallic acid, the coloration being much more distinct in some than in others. When this reagent is added to a solution of tannin, there is thrown down a precipitate which is usually at once redissolved. The bulk of this precipitate seems to be in direct ratio to the purity of the tannin, as Nos. 1, 2, and 5 gave very heavy precipitates, whereas those in 3 and 4 were scarcely noticeable. This precipitate was immediately redissolved in every case with exception of No. 8, but after a lapse of twenty-four hours it was found that all the solutions contained a more or less thick layer of another precipitate, which consisted of an amorphous white powder. This was smallest in No. 7, and gradually increased in the following order: 2, 9, 5, 4, 3, 1, 6 and 8. No attempt was made to estimate these precipitates, as it was found that an insoluble precipitate can, under certain conditions, at once be produced by this same reagent, so that it is possible that we have here another method for the gravimetric estimation of tannic acid, as well as for the separation of that acid from gallic acid; but further experiments are required to elucidate these points.

¹ "Chemical News," vol. xlviii, p. 31.

One feature in the table will strike every observer as being quite peculiar, if not altogether anomalous. If we take, for example, No. 8, we find the oxidizable matter other than tannin to be 38.3 per cent., and this consumed 0.0555 gram $K_2Mn_2O_8$, whereas in the case of No. 1 the oxidizable matter is 6.2 per cent., yet it consumed 0.0586 gram $K_2Mn_2O_8$. I fear I am unable to suggest a reasonable explanation for these apparent discrepancies; but it might be possible to account for them by supposing that we were estimating oak-bark tannin or mixtures of oak-bark tannin and gall tannin, in place of pure gall tannin. The coefficients assigned by Neubauer and Oser to oak-bark tannin are equivalent to 0.759 $K_2Mn_2O_8$ to $1\frac{1}{2}$ grams tannin, so that if we were prepared to assume that this tannin has been made use of, we would get in the case of No. 3, for example, 81 in place of 54, and so on. This theory is, however, opposed by two considerations. In the first place, Gunther allows very much the same value to oak-bark tannin as to gall tannin, the figures being 32 and 32.5 respectively to 16 of oxygen from the permanganate; and in the second place, a sample of gall tannin, prepared by another than the B. P. process, and not included in the table because not strictly a commercial tannin, showed much the same anomalous result, there being 66 per cent. of tannin and 26 per cent. of oxidizable matter other than tannin, the latter consuming only 0.055 gram $K_2Mn_2O_8$.

Moisture.—It was found to be impossible to take the moisture by drying in the usual way, as in no case could constant weighings be obtained, and recourse was therefore had to drying *in vacuo* over sulphuric acid. According to Strecker,¹ tannic acid heated to 160° C. becomes darker in color from incipient decomposition. Several of the samples began to change color very rapidly. No. 7, for example, being perceptibly darker after being kept for an hour at about 110° C., while No. 2 was apparently unaltered at the expiry of two and a half hours, all the others occupying positions between these two.

Ash.—Authorities, generally, are agreed that tannin should on incineration be free from ash, and, practically speaking, it was found that all the samples save one answered to this requirement, the exception, No. 7, giving as much as 0.4 per cent. This relatively large proportion of mineral matter doubtless accounts for the excess in weight of this sample as compared with those in which the tannic acid content is very similar.

¹ "Gmelin," vol. xv, p. 458.

	K ₂ Mn ₂ O ₈ required to oxidize 1 gram tannin.			Tannic acid Per cent.	Oxidizable matter other than tannin (by difference.)	Moisture.	Relative weight, lightest being 10.	One part tan- nin soluble in parts water at 60° F.
	Before precipitation.	After precipitation.	Differ- ence.					
1.	0.733	0.0586	0.6744	88.8	6.2	5.0	12	1
2.	0.479	0.0192	0.6598	86.9	5.1	8.0	10	1
3.	0.4737	0.0601	0.4136	54.4	40.6	5.0	25	1
4.	0.5015	0.0694	0.4321	56.9	36.1	7.0	28	1.5
5.	0.6173	0.0108	0.6065	79.9	14.1	6.0	10	2
6.	0.6172	0.0308	0.5864	77.2	15.8	7.0	12	1
7.	0.6913	0.0663	0.6250	82.3	14.3	3.0	24	3
8.	0.5091	0.0555	0.4536	59.7	37.3	3.0	41	1
9.	0.5756	0.0385	0.5371	70.7	25.3	4.0	30	1.5

—*Pharm. Jour. and Trans.*, p. 850, April 18, 1885.

SPURIOUS CUBEBS.

BY EDWARD D. GRAVILL.

Some weeks ago, when the false cubebs mentioned by Mr. Holmes in the Journal of May 9th were offered on the London market, a sample of the same was handed to me by Mr. Stacey, with a request that I should examine it and report to him the result. Mr. Stacey, at the time, expressed no doubt that the sample was a clever substitute for the true drug, and the result of a comparative microscopical and chemical examination was to confirm his opinion. Since that time I have had brought under my notice a powder, which, from the explanation given by Mr. Holmes, is similar to that examined by him. It was said to have produced sickness, and diarrhœa, together with considerable prostration and internal irritation, an effect differing entirely from that of the true powder, which the patient had before and afterwards taken. Having fresh in my memory the false berry above referred to, my impression was that some of these might have found their way into the genuine article, an idea which was partly substantiated by the distinctly mace-like odor of the powder.

No difficulty was experienced in distinguishing between the true and false powder, when unmixed, by their microscopical characters; but, in this case, I had evidently to deal with a mixture in which those characters were altogether unreliable.

My experience with the chemical tests, applied, in my case, to a

tincture, did not materially differ from those described by Mr. Holmes, but I would like to make the following addition. I found that a tincture of the true drug treated with an excess of strong sulphuric acid developed a decided deep violet coloration, and then when poured into water formed an opalescent deep blue solution. The false tincture, on the other hand, when treated in a similar manner, gave with the sulphuric acid a reddish brown color, which, on pouring into water, changed to a dirty yellow opalescence, without a shade of blue. This suggested to me that from the distinct colors obtained it might be possible to form some estimate of the extent of the substitution, and with this end in view the following experiments were performed :

A tincture of the true, false and suspected powders was separately made with rectified spirit, each being of the same strength as the official tincture.

One cc. of each was then treated with 10 cc. of strong sulphuric acid (sp. gr. 1·843), when the following colors were developed :

True.	False.	Suspected sample.
Deep violet.	Deep red brown.	Dull violet.

These acid mixtures were then poured into separate beakers, each containing four fluid ounces of distilled water, standing on a white tile, with the result that the following colors were observed :

True.	False.	Suspected sample.
Opalescent.	Opalescent.	Opalescent.
Deep blue.	Dirty yellow.	A very indistinct blue with a decided tinge of green.

The above colors were very distinct, and showed in the suspected sample undoubted presence of the two former colors.

The tinctures of the true and false drugs were next adjusted until the color obtained under the same treatment represented that of the suspected mixture, when the relative proportions required were 0·74 cc. of the true and 0·26 cc. of the false tinctures, which would represent an adulteration to the extent of 26 per cent.

I do not, of course, recommend the above as an accurate colorimetric method for estimating the adulteration, but, from subsequent experiments, have come to the conclusion that in the absence of reliable microscopical evidence it forms an easy means, not only of detecting the adulteration, but of forming an approximate idea as to the extent of this obnoxious, and evidently irritable and dangerous substitution for a most useful drug.—*Phar. Jour. and Trans.*, June 6, 1885.

THE SEAT OF THE ACTIVE PRINCIPLE IN VESICATING INSECTS.¹

BY H. BEAUREGARD.

The author has made an attempt to solve the hitherto incompletely elucidated question as to the exact seat of the cantharidin in the bodies of vesicating insects, using in his investigations the ordinary European *Cantharis vesicatoria*, of which he was favored with a good supply. The result of the researches upon this point made by Berthoud, Ferrer, Fumouze and Lissonde, using chemical methods, may be summed up in the proposition that "the soft parts are much more active than the hard parts (elytra, legs and head)." Courbon, experimenting physiologically upon *Epicauta adspersa*, denied that the hard parts exercised any epipastie action, and Leidy, speaking of *Epicauta vittata*, went further, and said of this species that "the vesicating principle resides in the blood and in a fatty matter peculiar to certain glands accessory to the generative organs and in the eggs" (see "Am. Jour. Phar., 1860, p. 157).

The author in his experiments estimated the vesicating property of the substance under examination, by applying to his arm either a moistened powder of the particular parts of the insect, or the mixture of oil and crystals obtained by macerating them twelve hours in acetic ether, expressing, filtering and evaporating. In this way he ascertained that in the case of *Cantharis vesicatoria* the blood is vesicant in a rather high degree, whilst the hard parts, free from blood, are absolutely inactive. As to the soft parts, he found that the muscles, respiratory and digestive organs, fat, and malpighian tubes are quite devoid of epispastie power, which resides solely in the genital apparatus.

In the male the testicles and the deferent canals are inactive, but an energetic vesicant property was found to reside especially in the pair of seminal vesicles situated in much elongated cylindrical tubes. The application to the forearm of a small portion of one of these vesicles determined the formation of a voluminous blister, with a painful tumefaction at the periphery. Sometimes a blister was obtained with the part of the deferent canals nearest to these tubes, but this was attributed to sperm contained in the canals, for in the majority of cases these were found to be completely inactive.

¹ From a paper read before the French Association for the Advancement of Science. ("Bulletin Commercial," xii, 437.)

In the female, all the parts of the genital apparatus and the eggs are epipastic. The eggs, after being deposited, were found to have a very energetic vesicant action, and this induced the author to see if this property disappeared at any period during the evolution of the insect to reappear subsequently. He found the larva as it first issues from egg is equally active, five and twenty of them reduced to a pulp and applied to the forearm producing a small blister. Lastly, the very young cantharides, measuring 8 to 10 millimetres long, which had not yet coupled, were found to be equally vesicant. These various results invalidate the conclusions of Nentwich ("Pharm. Journ." [3], i, 158; "Am. Jour. Phar.," 1870, p. 528), who asserted that the epispassic power is not developed until after the coupling of the insects, and that young or medium-sized insects do not determine the formation of blisters on the skin.

Experimenting as to the genera in which the vesicating property occurs, the author found it in species of *Meloe*, *Cerocoma*, *Mylabris*, *Coryna*, *Enas*, *Lydus*, *Alosymus*, *Cabalia*, *Lagorina*, *Cantharis*, *Lytta*, *Epicauta*, and *Sitaris*, many of which are already recognized as vesicants, but some have not yet been studied. He also found it present in *Henous confertus*, belonging to a genus that, to his knowledge, had not been properly tested. The genus *Zonitis* has been ranged by Leclerc among non-vesicant insects, but Beguin, on the contrary, has stated that he has found two species (*Z. præusta* and *Z. fulvipennis*) active. The author confirms the latter observer, since he obtained a large blister, after eight hours' application of *Z. mutica* and *Z. bilineata*. The genus *Nemognatha*, which has also been reported to be inactive by Leclerc, was found to have active representatives in *N. chrysomelina* and *N. lutea*. The author concludes from his experiments that, omitting the group of *Horiides*, all the insects belonging to the tribe Cantharides are vesicants.—*Phar. Jour. and Trans.*, April 25, 1835, p. 873.

Antiseptic Silk.—Freeman uses Chinese twist which has been rendered aseptic by boiling for ten minutes in a two per cent. solution of chromic acid, and then soaking for twelve hours in a one per cent. solution of the same. He states that the sutures may be left *in situ* for three weeks without the occurrence of either suppuration or softening of the silk. Silk thus prepared is especially useful in operations about the genital organs in women as well as in laparotomy.—*N. Y. Medical Journal*.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Dicinchonine, $C_{38}H_{44}N_4O_2$ according to O. Hesse, exists in the bark of *Cinchona rosulenta* and *C. succirubra*, chiefly in the branch bark of red cinchona. It may be obtained by fractional precipitation with sulphocyanide from the mixed amorphous alkaloids before melting, but not from commercial chinoidine, the dark colored compounds preventing crystallization. The bark of *C. rosulenta* is the best material, containing, besides cinchonidine, homocinchonidine, cinchonine and traces of quinamine and conquinamine, about 0.2 to 0.3 per cent. of dicinchonine. The neutral sulphate solution is treated with Rochelle salt for separating the first two alkaloids, then with excess of ammonia and shaken with small quantities of ether, whereby most of the cinchonine is left behind; the ether solution is agitated with dilute acetic acid, and this liquid neutralized and precipitated in fractions by potassium sulphocyanide, the first and third fractions being mixed with the other bases. The dicinchonine sulphocyanide is treated with caustic soda solution, the mixture extracted with ether the ether solution washed with water and evaporated, the residue dissolved in alcohol, neutralized with hydrochloric acid and evaporated when dicinchonine hydrochlorate crystallizes. The free base is easily soluble in ether, acetone, alcohol, chloroform and in benzol, less freely soluble in water and petroleum benzin, insoluble in caustic soda; the alcohol solution has an alkaline reaction and a bitter taste and is dextrorotatory; chlorine and ammonia do not produce a green color. The *hydrochlorate* crystallizes in anhydrous four-sided prisms which are often nearly cubical, and readily dissolve in water and alcohol. The *chloroplatinate* forms orange yellow flocks, readily soluble in hydrochloric acid. The *hydriodate* is in stout crystals, soluble in water, but insoluble in concentrated solution of sodium chloride or potassium iodide. The *sulphocyanide* is amorphous and separates from hot water as an oily layer. The *oxalate* is obtained in firm crystals on gradually adding an ether solution of oxalic acid to an ether solution of the base; the salt is freely soluble in cold water. On heating the alkaloid for 6 hours with concentrated hydrochloric acid to between 140° and 160° C., it is completely converted into *diapocinchonine*; and the same base is probably contained in the dark colored mass formed by heating

dicinchonine with sulphuric acid to 130° C.—*Ann. d. Chem.*, vol. 227, p. 153-161.

False cubebs have been offered in the London and New York market. In 1861 Gronewegen referred a false cubeb to *Piper anisatum*, *Humb. et Bonpl.*, and Stillé and Maisch (*Nat. Disp.*, 2d edit., p. 479, 3d edit., p. 522) consider this to be probably the same which Flückiger and Hanbury (*Pharmacographia*, 2d edit., p. 588) refer to *Piper crassipes*, *Korthals*. Wm. Kirkby finds the description of the latter to differ from that of the drug under notice, in that the stalk of *P. crassipes* is one and a half times to twice as long as the berry, and that the taste is very bitter. A fruit seen by Kirkby in Kew Gardens, said to be from *Piper sylvestre*? *Lam.*, closely resembles this false cubeb, but has a lighter color, a longer terete stalk, an odor reminding one of pepper, and a taste not aromatic. Kirkby's description of cubebs and the false drug, arranged for convenient comparison, is as follows:

Cubebs.

Spherical, somewhat pointed at the apex, reticulately wrinkled, contracted at the base into a stalk.

Color brownish gray or blackish.

Odor aromatic, spicy and characteristic.
 Taste pungent, aromatic, slightly bitter.
 Diameter 3 to 5 mm.
 Stalk 5 to 9 mm.

Pericarp in three layers. Exterior one, beneath the epidermis, an interrupted row of cubic thick-walled cells, in groups of three or four. Middle layer broad, made up of loose undeveloped tissue, containing stellate groups of needle-shaped crystals and large quantities of starch, and interspersed with larger oil cells, the latter colored red-brown with concentrated H_2SO_4 ; a section kept in glycerin for several weeks shows large groups of prismatic crystals, concentrically arranged. Inner layer consists of about four rows of parenchyma cells, tangentially elongated, and on outer margin of 11 or 12 wood bundles, formed mostly of narrow spiral vessels, with few dotted vessels.

False Cubebs.

Like cubebs, but more strongly wrinkled.

Color brownish gray to brown, rarely approaching black.

Odor rather pleasant, resembling mace.
 Taste aromatic, warm, somewhat bitter.
 Diameter 4 to 6 mm.
 Stalk flattened, 4 to 7 mm.

Pericarp in three layers. Exterior one, an interrupted ring of thickened cells, little larger than in cubebs. Middle layer composed of loose parenchyma, containing starch less abundantly than cubebs, and interspersed with oil cells, the latter colored red with H_2SO_4 ; a section does not yield crystals. Inner layer free from starch, composed of ten rows of tangentially extended thin-walled cells, and on outer margin of 14 or 15 wood bundles, formed of narrow spiral vessels, with few dotted vessels.

In both drugs the testa consists of one row of large encrusted, thick-walled cells, elongated and radially arranged, and containing calcium carbonate. Surrounding the perisperm is a red membrane formed of

rather large cells, and lining this is a thin colorless structure similar to it, but composed of smaller cells.

The perisperm is made up of angular parenchyma containing starch and oil, the oil cells colored red-brown by H_2SO_4 ; thin sections kept in glycerin for a few weeks, form thin plates of crystals in the perisperm of cubebs, but not in false cubebs.—*Phar. Jour. and Trans.*, Feb. 14, 1885, p. 653.

Asarum europæum. B. Rizza and A. Butlerow give to *asarone* the formula $C_{12}H_{16}O_3$ and state that it melts at $59^\circ C.$, boils at $296^\circ C.$, has the spec. grav. 1.165 at $18^\circ C.$, is inodorous, has a faintly pungent taste, is somewhat soluble in boiling water and crystallizes on cooling in delicate needles and scales. Graeger's *asarit* is merely *asarone* crystallized in fine needles.—*Ber. D. Ch. Ges.*, 1884, p. 1159.

Poleck communicates (*ibid.* p. 1415) a few of the results thus far obtained by Staats with the same substance. *Asarone* is very difficult to purify, is phosphorescent, melts at $61^\circ C.$, has most likely the composition $C_8H_{10}O_2$, yields with nitric acid oxalic acid and a neutral crystalline compound, and in addition to these, with potassium permanganate, carbonic, formic and acetic acids and a non-volatile crystalline acid.

Wood oil from *Elæococca cordata*, nat. ord. Euphorbiaceæ, has a decided brown color, and a disagreeable odor, is rather more fluid than castor oil, and on exposure dries rapidly. According to R. H. Davies, its spec. grav. at $60^\circ F.$ is .94015; it remains liquid at $-13.3^\circ C.$ ($8^\circ F.$), becomes black with sulphuric acid, solidifies and becomes orange-yellow with nitric acid, and yields with nitrous acid a dark semi-solid mass. 100 grams of the oil require 0.39 gram caustic potash for neutralization, and 21.1 grams for complete saponification. The mixture of fatty acids weighs 94.1 per cent. of the oil, melts at $39^\circ C.$, and its solution in alcohol readily yields crystals.—*Phar. Jour. and Trans.*, Feb. 7, 1885, p. 636.

E. M. Holmes states that this dark-colored oil is probably made by boiling the kernels previous to expression, the cold-drawn oil being colorless, inodorous and nearly tasteless. The latter, according to Cloëz ("Compt. Rend., 1875, vol. 81, p. 469), has the spec. grav. 0.9362, congeals at $-18^\circ C.$ to a transparent mass, solidifies rapidly when exposed to light in a closed vessel, and is the most drying oil known. It is used in skin diseases, for ulcerated wounds and carbuncles, for varnishing furniture, all kinds of wood work, umbrellas,

paper and paper leather, and for painting and caulking junks.—*Ibid.*, p. 637.

Baillon names the tree *Aleurites cordata*, and mentions as synonyms *Dryandra cordata*, *Thunberg*, *Dr. Vernicia*, *Correa*, and *Elæococca Vernicia*, *Sprengel*.

White birch tar, *Oleum Rusci*.—P. Macewan has examined three commercial samples of this tar, the odor of betulin being present in each, but harsher in the German and Dutch oils than in the Russian, which is pleasant. The saponifiable substances were ascertained by shaking the ether solution with excess of potash solution, acidifying the alkaline liquid and treating with ether.

	Russian.	German.	Dutch.
Physical properties.....	Thick brown-black, sp. gr. '955.	Limpid, brown, sp. gr. '967.	Limpid, translucent, red brown, sp. gr., '941.
Cold water filtrate.....	Colorless, fragrant.	Yellowish brown, empyreumatic.	Yellow. empyreumatic.
Blue litmus.....	Faintly acid.	Distinctly acid.	Faintly acid.
Fe ₂ Cl ₆ (solution).....	Green brown.	Greenish brown.	Pale brown.
Fe ₂ Cl ₆ on dilution.....	Muddy.	Loses transparency.	Clear.
KCy (solution).....	Pink, intensified by AmHO.	No change.	No change.
Non-saponifiable bodies.....	64.47; red-brown, oily, odor unaltered.	16.12; similar to Russian.	36.54; pale brown, limpid, odor, terebinthinate.
Saponifiable bodies.....	16.57; black, consistence of lard, slightly empyreumatic.	19.84, black, sticky, resinous, strongly empyreumatic.	10.62; brown, semi-fluid, resinous, intensely empyreumatic.
Insoluble and vaporized below 100° C.....	18.96 per cent.	64.04 per cent.	52.84 per cent.

—*Phar. Jour. and Trans.*, March 21, 1885, p. 769.

Examination of Fats.—For this purpose Hübl regards only those methods as useful which are based on quantitative determinations, whether of chemical or physical nature. Such methods, which the author calls "quantitative reactions" afford valuable indications of the purity of fats as they are connected with their chemical constitution, qualitative tests are of value in doubtful cases and serve to control the conclusions drawn from the former. Of the three groups of acids present in fats, those belonging to the acetic acid series remain unaltered under ordinary conditions by haloids, while the acids of the oleic acid group take up two haloid atoms very readily, and those of the linoleic acid group four atoms. The author recommends

for this purpose an alcoholic solution of iodine in the presence of mercuric chloride, which acts on the unsaturated fatty acids at the ordinary temperature, the excess of iodine used being estimated with a solution of sodium thiosulphate. The percentage of iodine taken up is called the "iodine number." The following table is given by the author.

Oils.	Iodine number.	Fatty acid		Saponification value.	Solution in equal parts glacial acetic acid is rendered turbid at
		Melts at	Solidifies at		
1. <i>Drying oils.</i>		Deg.	Deg.		Deg.
Linseed.....	158.0	17.0	13.3	191.3	.....
Hempseed.....	143.0	19.0	15.0	193.1	.....
Walnut.....	143.0	20.0	16.0	196.0	.....
Poppy seed.....	136.0	20.5	16.5	194.6	.....
Pumpkin seed.....	121.0	28.0	24.5	189.5	108
Sesame.....	106.0	26.0	22.3	190.0	107
Cotton seed.....	106.0	27.7	30.5	195.0	110
Arachis.....	103.0	27.7	23.8	191.3	112
Rape seed.....	101.0	20.1	12.2	177.0	Insoluble.
2. <i>Non-drying oils.</i>					
Apricot kernel.....	100.0	4.5	0.0	192.9	114
Almond.....	98.4	14.0	5.0	195.4	110
Castor.....	84.4	13.0	3.0	181.0	Soluble in the cold.
Olive.....	82.8	26.0	21.2	191.7	85-111
Olive kernel.....	81.8	.....	.....	188.5	Soluble in the cold.
Bone oil.....	68.0	30.0	28.0	.....	.....
Lard oil.....	59.0	.....	.....	195.9	.....
Butterin.....	53.3	42.0	39.8	.....	.....
Palm oil.....	51.5	47.8	42.7	202.2	23.0
Laurel oil.....	49.0	27.0	22.0	.....	26.5
Tallow.....	46.0	45.0	43.0	196.5	95.0
Suet.....	36.0	41.8	40.0	170.0	.....
Cacao butter.....	31.0	52.0	51.0	.....	105.0
Nutmeg butter.....	31.0	42.5	40.0	.....	27.0
Butter fat.....	31.0	38.0	35.8	227.0	.....
Cocoanut oil.....	8.9	24.6	20.4	261.3	40.0
Japanese wax.....	4.2	.....	.....	222.0	.....

—*Dingl. Polyt. Jour.*, vol. 253, pp. 281-295; *Jour. Chem. Soc.*, 1884, p. 1435.

THE CHANGES OCCURRING IN BARLEY DURING MALT-ING, AND IN THE MANUFACTURE OF SPIRITS.

BY P. BEHREND

Removal of Organic and Inorganic Matter by Water.—The quality of the malt for brewing purposes is much influenced by the water in which it has been soaked, for if this water removes too much of the phosphates and potash, the yeast is unable to develop thoroughly; the water, regarded chemically, is not the only factor to be considered, attention must also be paid to the time of soaking and the temperature. The experiments were made on three varieties of barley, and it was noted that the largest percentage of material was removed from the smallest grains, due to the fact that the surface exposed to the water is relatively larger in the small than in the large grain. The author found that about one-half of the dry matter removed consisted of organic matter; this observation is directly opposed to that made by Mulder and Lerner, who found that the greater part of the extract consisted of organic matter. The practical outcome of the research is that barley must not be soaked too long else it will not germinate well, and the fermentation will be languid; more attention must be paid when small grained barley is malted than when the large sized is used.

The Changes which the Nitrogenous Matter undergoes.—The conversion of insoluble into soluble nitrogenous matter is very rapid, the soluble will increase six times by the end of nine days' malting. Hungarian and Saal barley were closely examined during malting, and analytical data are given showing the gradual conversion of albumin into soluble nitrogenous matter, the period of conversion extended over 209 hours; no free nitrogen was noticed. It was also found that the soluble nitrogenous matter did not consist wholly of amides, but that a part of the albumin became soluble without decomposition, and this the more rapidly, the quicker the malting—that is the formation of diastase—proceeded. Another piece of information gained of practical advantage is, that the length of the shoots is no indication of the extent to which the change of the albumin has gone.

Changes of the Albuminoids in Cereals and Potatoes when Heated under Pressure.—At high temperatures, the albuminoids are rendered soluble, amides being formed, consequently the feeding value of the waste products is much reduced; but, on the other hand, this conversion is no detriment to the growth of the ferment, which seems to

flourish equally well on albumins as on amides. When heated at 140° in Lintner's digester for six hours the albuminoids of lupines suffer much change; there was an increase of nearly double of the non-albuminoids whilst the albuminoid nitrogen soluble in water was increased by 13.9 per cent. In peas, soluble non-albuminoid nitrogen was increased from 35 to 87.8 per cent. and 36.6 per cent. of the insoluble albumin was made soluble. Maize and dari were also much affected. Experiments with potatoes showed that if they had been previously dried at 110°, a part of the albumin being thus rendered insoluble, the after heating by steam at a high temperature was incapable of restoring all the coagulated albumin to a condition of solubility. To ascertain whether working on the large scale produced the same effect on albuminoids, as the small laboratory experiments, maize and dari were heated in a Henze's steamer under a pressure of four atmospheres. The results obtained to a certain extent corroborated the original experiments, but the changes were not so marked. A short steaming dissolves the albumin, but long continued steaming converts the albumin into amides.—*Jour. Chem. Soc.*, May, 1885, p. 617; from *Bied. Centr.*, 1885, 51-56.

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 29, 1885.

A stated meeting of the members of the Philadelphia College of Pharmacy was held in the Hall of the College, Monday, June 29, 1885, Charles Bullock, President, in the chair.

14 members present.

The minutes of the last meeting (March) were read and approved.

The minutes of the Board of Trustees for April, May and June, were also read and approved.

The following named gentlemen were elected delegates to the meeting of the American Pharmaceutical Association, to be held in Pittsburg in September next:

Alonzo Robbins, Wallace Procter, Joseph P. Remington, Gustavus Pile, Wm. P. Jenks.

Mr. Wm. McIntyre announced the death of G. W. Eldridge, a member of the College, which occurred suddenly on the 25th inst.

Mr. Alonzo Robbins presented the following report of the Delegates to the last meeting of Pennsylvania Pharmaceutical Association:

The undersigned, Chairman of the Delegation elected to attend the annual meeting of the Pennsylvania Pharmaceutical Association, respectfully reports as follows:

The meeting was held at Erie, commencing on the evening of June 2d. The Association was welcomed in a few words by the Mayor of the city,

who then introduced Dr. Evans, who delivered an eloquent address, which was appropriately responded to on behalf of the Association by Mr. I. H. Redsecker, of Lebanon.

Due to the fact that a large majority of the members of the Association reside in the central and eastern parts of the State, the meeting was not as numerously attended as usual, but in most other respects it was as successful as any held in previous years. Twenty original papers were read during the sessions, while the gain of a considerable addition to the membership in a part of our State in which the Association had hitherto been without any representatives, was alone sufficient proof of the wisdom of holding a meeting so far west.

Charles T. George, of Harrisburg, was elected President; James A. Meyers, of Columbia, and William L. Turner, of Philadelphia, were elected first and second Vice-Presidents.

The Association adjourned on Thursday morning, to meet at Lebanon on the second Tuesday of June, 1886.

On Thursday afternoon a steaniboat excursion on Lake Erie was given, during which the U. S. Life Saving Station and other points of interest were visited. The festivities terminated in the evening with a banquet at Massassauga Point, from which the boat returned at an early hour in the midst of a tremendous rain storm.

Respectfully submitted,

ALONZO ROBBINS, *Chairman.*

June 29, 1885.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Thirty-third Annual Meeting of this Association will be held in Lafayette Hall, in the city of Pittsburg, Pa., on the second Tuesday, the 5th of September, at 3 o'clock P.M.

Ample room has been provided at the City Hall for the exhibition of articles possessing pharmaceutical interest, and not prohibited by the rules of the Association. The exhibition room is in charge of the Local Secretary, Mr. George A. Kelly, Pittsburg, Pa., and will be ready for the reception of goods on Tuesday, September 1st.

All pharmaceutical organizations entitled to representation in this Association are invited to appoint delegates—five from each body—whose credentials should be sent to Prof. John M. Maisch, Permanent Secretary, Philadelphia, Pa., at least two weeks in advance of the meeting.

Applications for membership should be forwarded to Mr. George W. Kennedy, Pottsville, Pa.

Those who have accepted queries should send their replies to Prof. J. U. Lloyd, Cincinnati, Ohio, in advance of the meeting, that they may receive proper attention; this also applies to volunteer papers.

The Chairman of the Committee on Entertainment and Railroad Transportation will announce at the proper time such arrangements as have been made with the transportation companies for reduced fares, and also any programme which may have been devised for the social entertainment of the Association.

JOHN INGALLS, *President.*

Macon, Georgia, June 18, 1885.

MEETINGS OF STATE PHARMACEUTICAL ASSOCIATIONS.

With few exceptions all the State Pharmaceutical Associations have held their annual meetings, most of which have been well attended. As might have been expected, the local conditions of pharmacy and the trade interests formed conspicuous subjects for discussion, and among the latter the retailing of proprietary medicines at reduced prices was not unfrequently alluded to; but no suggestions were made at any one of the meetings, we believe, combatting that evil, which has done more than any other factor to lessen the scientific interest of pharmacists, and to degrade the practice of pharmacy to the level of mere buying and selling. It is to be noted that a number of papers were read counselling greater discrimination than heretofore in the selection of apprentices, in regard to their educational attainments and other qualifications; for the present these essays must be necessarily suggestive merely; but it is to be hoped that before long, ways will be found for putting into practice that which is theoretically conceded to be necessary and proper.

In the following we propose to give a brief account of the transactions at the various meetings, with a synopsis of some of the papers having scientific or practical interest.

ALABAMA.—The fourth annual meeting was held at Anniston, May 5th, and was mainly devoted to routine business. A. L. Stollenwerck, of Birmingham, was elected President; P. C. Candidus, of Mobile, Secretary, and E. P. Galt, of Selma, Treasurer. The next meeting will be held in Birmingham, on the second Tuesday of May, 1886.

CONNECTICUT.—The ninth annual meeting was held at Hartford, February 3d. Papers on sodium salicylate, by C. H. Whittlesey, and on syrup of orange, by S. F. Guernsey, were read. The association will meet next year at New Haven, on the first Tuesday of February. The President for the current year is J. K. Williams, of Hartford; Secretary, F. Wilcox, of Waterbury; Treasurer, G. P. Chandler, of Hartford, and Local Secretary, Romanta Wells, of New Haven.

GEORGIA.—The tenth annual meeting assembled at Atlanta, April 14th. Among the papers read was one by R. H. Land, on the medicinal plants of Georgia; one by O. Butler, on a cheap disinfectant for the sick room, and one by Th. Schumann, on the manufacture of chemicals by pharmacists. Several prizes were awarded for essays read and for preparations made. H. G. Hutchinson was elected President; W. S. Parks, Secretary, and T. L. Massenburg, Treasurer.

INDIANA.—The fourth annual meeting was held at Indianapolis, May 12th and 13th. Among the papers read was one by Prof. R. B. Warder, on *qualitative analysis without using sulphuretted hydrogen*; in this scheme an excess of ammonium sulphide is used in the beginning for separating arsenic and allied metals in solution, the precipitate being treated with cold diluted hydrochloric acid, which leaves mercury, lead and allied metals undissolved, while iron and aluminium enter in solution. A paper by Jos. K. Lilly, on *standardizing pharmaceutical preparations*, advocates

such a plan for drugs the virtues of which depend upon alkaloids or resins. The *preparation of extracts for flavorings for soda water* was the subject of a paper by Leo Eliel; the *use of fluid extracts for tinctures*, by T. S. Motter; an *analysis of one thousand prescriptions*, by G. W. Sloan; *pharmacopœial tests*, by Prof. Hurty, and papers on trade interests, by L. Lybrand and D. Hilt. Aug. Detzer, of Fort Wayne, was elected President and Emil Martin and J. R. Perry, of Indianapolis, were re-elected Treasurer and Secretary. The next meeting will convene at Lafayette at the call of the Executive Committee; Dav. Hilt is Local Secretary.

IOWA.—The sixth annual meeting took place at Council Bluffs, May 12th, most of the time being occupied with routine business, and with discussions on the pharmacy law, and the liquor law as affecting druggists. Several brief notes were read by R. W. Crawford, advocating the *use of phosphoric acid* in the place of phosphorus for liquid mixtures; recommending the addition of *glycerin to extracts* inclined to become hard, and approving, under certain conditions, the use of *gelatin capsules for suppositories*. To the question, Should the pharmacists support those journals which *sell their columns for the use of quack nostrum advertisements?* there was an evasive answer given. Mr. F. E. Houghton found a mixture of equal parts of glycerin and water to be an available *solvent for tartrate of iron and potassium*, a solution of 10 grains to the fluidounce keeping unaltered for a month; but after 10 months it contained considerable sediment.

C. R. Wallace, of Independence was elected President, E. L. Boerner of Iowa City, secretary, and C. H. Ward, of Des Moines, Treasurer. Des Moines was selected as the place for the next meeting, to take place on the second Wednesday of February, 1886, and A. H. Miles was elected local Secretary.

KANSAS.—The sixth annual meeting convened in Lawrence June 10. Mr. Lucius E. Sayre, of Philadelphia, a graduate of the Philadelphia College of Pharmacy, who has recently been elected Professor of Pharmacy in the new pharmaceutical school connected with the University of Kansas, was present and read a paper on *pepsin*. Papers were also read on the presence of *carbolic acid in commercial salicylic acid*, by H. W. Mehl; on *nitrous ether*, by R. H. T. Nesbit; on *morphine strength of laudanum*, by M. Schott, and on *fungous growths in aqueous solutions*, by R. J. Brown.

H. W. Spangler, of Perry, was elected President, J. T. Moore, of Lawrence, Secretary, and C. D. Barnes, of Abilene, Treasurer. Emporia will be the next place of meeting on the second Wednesday of June, 1886; the local Secretary is D. W. Morris.

KENTUCKY.—The eighth annual meeting was held at Danville, May 20, and was devoted to routine business and the consideration of further pharmaceutical legislation. Papers were read on *adulterations*, by H. W. Evans, on *citrine ointment*, by O. Gier; on *explosive mixtures*, by E. C. Pfingst, on *quinine pills*, by G. A. Zwick, and on *arsenic*, by Jeff. Oxley. H. W. Evans, of Danville, was elected President, J. T. Cook, of Harrodsburg, Secretary, and J. J. Brooks, of Richmond, Treasurer.

The place of the next annual meeting is Bowling Green; the time has been fixed for the first Wednesday in May, 1886. Wm. Turner is the local Secretary.

LOUISIANA.—The third annual meeting was held at New Orleans, May 27. Five papers were read, one being on the use of the microscope, and another on unofficial formulas. Mr. Chas. Mohr, of Mobile, was elected an honorary member. The officers for the current year are: A. R. Finlay, President, L. C. Chalin, Secretary, and J. B. Lavigne, Treasurer. The next meeting will again be held in New Orleans, on the third Wednesday of April, 1886.

MARYLAND.—The third annual meeting was held at Hagerstown, May 12 and 13. No report of the transactions has been received.

MASSACHUSETTS.—The fourth annual meeting convened in Pittsfield, June 3 and 4. The following papers were read: *Books and methods of study for pharmacists*, by Prof. E. L. Patch, *new chemicals and pharmaceutical preparations*, by F. A. Davidson; *tinting of morphine salts*, with an aniline color for the purpose of preventing their being mistaken for quinine, by W. C. Durkee; *incompatibility in prescription*, by Prof. Markoe; on the *sale of opiates to habitual opium eaters*, by W. W. Hill, who urged that the sale be discouraged; *test for oleomargarin*, by W. W. Bartlett, recommending Hehner's method and limiting the maximum amount of fatty acids of pure butter to 90 per cent; on *tincture of ginger*, by S. A. D. Sheppard, arriving at the result that a tincture or fluid extract, having the full medicinal effect of ginger cannot be prepared so as to mix with water without precipitation; *pharmaceutical notes*, by J. W. Colcord. Discussions were also had on several practical questions.

The present officers are F. M. Pease, of Lee, President, J. W. Colcord, of Lynn, Secretary, and F. H. Butler, of Lowell, Treasurer. The Association adjourned to meet in Boston on the first Wednesday of June, 1886, Henry Canning acting as local Secretary.

MINNESOTA.—The annual meeting was adjourned from the 9th to the 16th and 17th of June, so as to take place in the same week in which the State Medical Association convened in St. Paul.

MISSISSIPPI.—The second annual meeting was held at Natchez, May 19th. After considerable discussion a committee was appointed for preparing a law which is to be presented to the next Legislature for enactment. Dr. J. B. Bond read a paper on *tinting morphine*, with the view of preventing its being mistaken for quinine. The officers for the present year are J. P. Finlay, of Greenville, President; H. F. West, of Fayette, Secretary, and W. R. Bunning, of Natchez, Treasurer. The next meeting will be held at Jackson on the third Tuesday of May, 1886.

MISSOURI.—The seventh annual meeting took place at Sweet Springs, June 16 and 17, when papers were read by Prof. Curtman on *tests for purity of quinine*; by Prof. Wall on *how to study drugs*; by G. H. C. Klie on the advantages of *making tinctures by percolation*, and another entitled *miscellaneous notes*; by Prof. Good on *authoritative non-official formulas*; by F. G. Kerr on *syrup of tolu*, and by Dr. Bond on *tinting morphine*. Dr. Bond was elected an honorary member. A movement was inaugurated aiming at interstate meetings of the Pharmaceutical Associations of Iowa, Kansas, Missouri and Nebraska.

The next meeting will again be held at Sweet Springs, the time being the third Tuesday of June, 1886. A. T. Fleischman, of Sedalia, is Presi-

dent for the current year; G. H. C. Klie, of St. Louis, Secretary, and Prof. Good, Treasurer.

NEBRASKA.—The fourth annual meeting assembled at Omaha, May 13 and 14. A paper on *syrup of the hypophosphites* of calcium, sodium, quinine and manganese was read by N. A. Kuhn. Omaha was again selected as the place for holding the annual meeting, and the time was fixed for the second Tuesday of May, 1886. The officers elected are H. D. Boyden, of Grand Island, President; F. P. Zimmer, of Grand Island, Secretary; J. Forsythe, of Omaha, Treasurer, and C. J. Daubach, Local Secretary.

NEW JERSEY.—The fifteenth annual meeting convened in Camden, May 20 and 21. There are now 1,191 registered pharmacists in the State. The draft of an amended pharmacy act was carefully considered and referred to a committee for presentation to the Legislature. Three or four papers were read urging to provide for a good primary education of those contemplating to become apprentices in pharmacy. A paper by Aug. Drescher on *sediment in infusion of digitalis*, showed that the sediment contained digitalin, and it was stated that such an infusion deprived of the sediment, had on several occasions been found to produce no effect, and that the flavor of cinnamon might preferably be imparted by the volatile oil, instead of the bark. Attention was also drawn to the fact that in Europe the leaves collected from plants grown on mountains have been shown to be more efficacious than those grown in valleys or collected from cultivated plants, the latter being decidedly less hairy. An occasional *offensive odor of simple syrup* was traced by Aug. Drescher to sulphuretted hydrogen produced from the ultramarine, which is used for neutralizing the yellow tint of inferior grades of sugar. In a paper on *syrup of tolu* A. Drescher agrees with the views of E. Claassen, but thinks that as a flavoring syrup it is a failure and that it should be dropped from the Pharmacopœia; to obtain the medicinal effects of tolu, it should be given in emulsion. A paper on *incompatibles*, chemical and physiological, by P. E. Honnigell, and one entitled *random notes*, treating of various practical subjects, by H. P. Reynolds were also read. The last named paper gives the following formula for *Pulvis morphine acetatis compositus*, which has been long prescribed in Plainfield; morphine acetate 1 gr., camphor 2 gr., ipecac 4 gr., precipitated calcium carbonate 12 gr., and sugar 21 gr. The officers elected were W. M. Townley, of Newark, President; R. H. Vansant, of Trenton, Secretary, and W. Rust, of New Brunswick, Treasurer. The Association will meet next in Newark on the third Wednesday of May, 1886.

NEW YORK.—The seventh annual meeting was held in Saratoga, June 16, 17 and 18. The following papers were read in full, besides a number which were read by title: on *unofficial formulas* by S. J. Bendiner, making suggestions for increasing those published in the New York and Brooklyn formulary; on *soap liniment* by W. P. De Forest, suggesting a weaker alcohol as menstruum so as to render the liniment more stable; on *botanical knowledge* required by pharmacy boards, by the same author; on *spirit of nitrous ether* by Dr. Eccles; on *pharmacy laws* and on the *merchandise* in a pharmacist's stock by A. C. Searles; on the comparative

value of *red and white wines* as applied to the pharmacopœial requirements by Prof. Bedford, and on *medicinal syrups* by C. W. Holmes.

The President for the present year is T. J. Maenhahan, of New York; Secretary C. W. Holmes, of Elmira, and Treasurer C. H. Butler, of Oswego. The Association adjourned to meet in Rochester on the second Tuesday of June, 1886.

OHIO.—The seventh annual meeting assembled in Sandusky, May 20 and 21. The business transacted was mostly of a routine nature. Twenty papers were presented, but only few of them could be read during the meeting. A paper on *commercial belladonna leaves* by Prof. Coblenz reported the assays of 14 samples, namely 8 of American pressed leaves, which yielded between '0020 and '0433 per cent. of pure alkaloid; 4 samples of loose German leaves yielded between '0109 and '0420 per cent., and 2 samples of English leaves '0411 and '0422 per cent. of pure alkaloid. The alkaloid was extracted from the concentrated tincture containing tartaric acid, with chloroform, and purified by precipitation with iodine, treatment with sodium thiosulphate and solution in chloroform.

Unguentum Hydrargyri nitratis, by H. C. Cook. Made with lard oil, heated with the nitric acid to 50°C., and slowly raising the heat to 70°C., the ointment retained its bright color for a long time; made with petrolatum in various ways the ointment acquired a dark color, and was less efficient than the official article.

Commercial black antimony. Examined by S. W. McKeown, the cheap grades were found to be coal dust mixed with marble or other substance, and with or without a little sulphide of antimony.

Commercial precipitated sulphur. Of seven samples S. W. McKeown found one to be pure; the others contained about half their weight of calcium sulphate.

Commercial iodine. Eleven samples examined by Miss H. M. Spenser contained between 96.5 and 99.1 per cent. of pure iodine.

Tinctura opii deodorata. Two papers were presented by Ph. Acker and by Prof. Coblenz, both reporting that petroleum benzin, while it removes from opium odorous and other principles, does not dissolve the narcotine. Prof. Coblenz found 10 gm. of opium to yield to ether 0.307 gm., and to benzin 0.158 gm., the difference between the two figures being narcotine.

Pills of nitrate of silver. T. Daniels recommends as the best excipient a mixture of petrolatum 1 part, with kaolin 2 parts.

Powdered capsicum, according to S. W. McKeown, should yield about 28 per cent. of alcoholic extract, and on incineration about 4.5 per cent. of white ash. If adulterated with corn meal, a smaller amount of alcoholic extract and a larger amount of ash is obtained, the latter being red or brown, probably due to ochre used for coloring.

Commercial tartaric acid was found by C. M. Reed to contain a minute amount, '068 per cent., of adhering sulphuric acid.

Baking powder. S. W. McKeown recommends a satisfactory article, to be made of cream of tartar 7 parts, sodium bicarbonate 3 parts and starch 3 parts.

The subjects of other papers were pancreatin as an emulsifying agent,

volatility of camphor, fluid hydrastis, aniline dyes, commercial hydrobromic acid, disinfectants, syrup of tolu, pill manufacture and removal of glass stoppers.

The officers elected were W. M. Melville, of Sandusky, President; L. C. Hopp, of Cleveland, Secretary, and Chas. Huston, of Columbus, Treasurer. The next meeting will take place at Springfield, on the first Wednesday in June, 1886, Chas. Ludlow being Local Secretary.

PENNSYLVANIA.—The eighth annual meeting convened at Erie, June 2d, and adjourned June 4th. Twenty papers were read, eight of which related to ethical questions and trade interests. A very valuable paper on *drug store insurance*, by M. N. Kline, showed that the premium for insurance differs considerably, and is almost without exception much higher than for other merchandise, while the losses by fire were shown to be too small to warrant the classification of such stock as "extra hazardous."

Sulphuric acid, by Gust. Pile. An acid containing 96 per cent. of H_2SO_4 approaches in density nearly to 1.835, which coincides with the gravity adopted by the oil of vitriol makers. Nitrous acid, N_2O_3 , is soluble in strong sulphuric acid, and in case of full saturation increases the density to 1.860. Nitric acid and mineral impurities do not materially affect the density. The paper describes, also, the Glover tower, which has been recently introduced for the manufacture of sulphuric acid.

Aqua ammoniæ, by G. W. Kennedy. Thirty-six samples were examined, and with very few exceptions were found to be of the required standard; the few cases of deficiency of strength could be traced to careless handling and keeping in small quantities in large vessels.

Lithium salts. J. W. Miller finds that the benzoate, citrate and salicylate could be readily prepared by the pharmacist so as to afford a handsome profit; but, owing to the small quantity used, this plan would not be economical. Home manufacture is, however, advocated for pharmaceuticals generally.

Benzoin.—F. H. E. Gleim has obtained from four samples of benzoin not over $1\frac{2}{3}$ per cent. of benzoic acid, and by sublimation much less; variety and quality of the samples are not described.

Fixed oil of ergot.—J. H. Redsecker ascertained that the powder left in the preparation of fluid extract of ergot by the officinal process, yields with benzin an oil which is identical in appearance and properties with the oil prepared from the unexhausted drug. It was stated that the oil obtained from the commercial powdered ergot has a dark color, probably due to the heat used for drying the ergot, while the pure oil is pale yellow or nearly colorless.

Orange flower water.—J. L. Lemberger showed that orange flowers gathered in Florida, salted, and after four months distilled, yielded a very good water.

Powdered extracts.—Ch. T. George showed that the extracts of colocynth, calumba, krameria and opium may be powdered without adding a diluent. To other extracts he added potato starch, in the proportion of 15 per cent. to drugs exhausted by alcohol, and 25 per cent. to drugs exhausted with diluted alcohol. With proper care such extracts will remain in a good, dry condition for years.

Bile, though not much used, is regarded by J. F. Patton as possessing sufficient value to merit the space accorded to it in the pharmacopœia.

Pills of phosphorus, properly made and kept in a dry place were found by C. F. Randolph to remain in good condition and to evolve white vapors when cut after a year; if kept in the cellar the pills became soft and mouldy. The best coating for such pills seems to be gelatin.

The use of *fluid extracts* for making other pharmaceutical preparations was discussed by C. T. George who regards the practice as neither professional nor legitimate.

The *pharmacopœial standard* for pharmaceutical preparations was stated by G. W. Stoeckel to be adhered to by fully eight-ninths of the pharmacists of Pennsylvania, as far as strength is concerned, though other than pharmacopœial processes are often followed. Fluid extracts and some other preparations were stated not to be made by pharmacists as generally as desirable. Many preparations put up for the country trade were often found to be very deficient.

A paper on products from the natural order of *Verbenaceæ* is published on page 330.

After the report on adulterations had been read, Prof. Maisch called attention to two substitutions lately observed by him in this country, namely, *spurious cubebs*, of which a considerable quantity appears to be in our market (for characters see page 353), and *false sumbul*, the root of *Dorema Ammoniacum*, which is of a closer texture, firmer and denser than *sumbul*, of a decided yellow color internally and of a feeble musk odor superficially, imparted by dipping the pieces into a soft extract of *sumbul*.

The president for the current year is Chas. T. George, of Harrisburg. Dr. L. Wolff, having retired from the drug business and accepted the appointment as Demonstrator of medical chemistry and toxicology in the Jefferson Medical College, declined the nomination as one of the executive officers, and J. A. Meyers, of Columbia, and Wm. L. Turner, of Philadelphia, were elected Vice-presidents. Dr. J. A. Miller, of Harrisburg, was re-elected Secretary, and J. L. Lemberger Treasurer. The next meeting will be held at Lebanon, with G. R. Ross as local Secretary.

TEXAS.—The sixth annual meeting convened in San Antonio, May 13th, the deliberations extending over two days. Routine matter, pharmacy law, renewal of physicians prescriptions and similar subjects formed the topics for discussion, and papers were read by J. W. Graham on *spirit of nitre*, and by G. S. Richardson on the bark of *Sambucus canadensis*. The President elected is G. H. Kalteyer, of San Antonio; Secretary G. Rice, of San Antonio; Treasurer E. W. Lancaster, of Marshall, and G. A. Eisenlohr was elected local Secretary, Dallas being chosen as the place for the next meeting, the date to correspond with the meeting of the Medical Association at the same place.

VIRGINIA.—The fourth annual meeting was held at Charlottesville, May 19 to 21. The reading of reports and of several papers, discussions on pharmaceutical legislation and various practical questions, and routine business claimed the attention of the members. J. W. Thomas, Jr., of Norfolk, was elected President, E. R. Beckwith, of Petersburg, Secretary,

and F. H. Masi, of Norfolk, Treasurer. The next meeting will convene in Alexandria, on the second Tuesday in May, 1886.

WEST VIRGINIA.—The fifth annual meeting assembled in Grafton, June 9. The reports of officers and committees and several papers were read and discussed. J. A. Grant, of Grafton, was elected President, and C. Menkemeller, of Wheeling, Secretary and Treasurer. The next meeting will take place at Wheeling, on the second Tuesday of June, 1886.

EDITORIAL DEPARTMENT.

PHARMACEUTICAL LEGISLATION.—During the present year pharmacy laws have been enacted in four States, in which heretofore the practice of pharmacy had not been regulated by law, namely, Kansas, Massachusetts, Michigan and Minnesota. These laws are similar to those which are in force in other States, and, properly carried out, will prevent grossly incompetent persons from entering a business in which knowledge, skill and prudence are the real safeguards of the customers.

It is known that the existing pharmacy laws, notwithstanding their general similarity, show little uniformity in some important points, and the same holds good also for the new laws. While, for instance, in Minnesota graduates of any medical school are lawfully capable of conducting a pharmaceutical business, the board is empowered to discriminate between the schools of pharmacy, the same as in Kansas; but, in the latter State, graduates in medicine have not the prerogative conferred upon them by law to become pharmacists without having had pharmaceutical experience. In Michigan, on the other hand, no diploma is recognized, but licentiates of other boards may be registered without examination.

Other differences are found in the manner of selecting the board, in the examining fees, in the annual registration fees, in the poison clauses, the qualification of assistants, etc.

Maine has had a pharmacy law since 1877, which, notwithstanding several defects, has been well administered. The commissioners, knowing these defects, had framed an amended bill and presented it with their official annual report. Without their knowledge, however, a bill was passed by the Legislature, and approved March 6, 1885, in which most, if not all, the objectionable features are retained and others, still more objectionable ones, have been legalized. The commissioners appointed by the Governor must, as in the old law, be *suitable persons*, but wherein their suitability is to consist is not stated. While every applicant for registration is apparently required to submit to an examination after presenting satisfactory evidence of having three years' experience, or being a graduate in medicine or in pharmacy, and in addition thereto that he is competent for the business; exceptions are made in favor of practising physicians who may do the business of an apothecary *without being registered*, and in favor of those who were engaged in the business March 11, 1877, and *hereafter* enter on the business of an apothecary, they being dispensed from the examina-

tion. Another curious clause is the one allowing any person to enter upon the business of an apothecary *without registration*, provided he does not personally do the duties of an apothecary, but employs a registered apothecary.

The struggles for pharmacy laws in some of the States have lasted for a number of years; but while in Massachusetts they have come to a successful issue, even though the law be not as perfect as might be desired, in other States the attempts have again failed. The bill which was before the Pennsylvania Legislature was at first burdened with amendments not germane to its objects, as for instance the prohibition of renewing prescriptions without the physician's written order, and after these failed, the bill secured a majority of 93 against 77 in the House, but failed for the want of the constitutional majority.

It may be mentioned yet that the Kansas pharmacy law makes the apothecary the custodian of the original prescription; likewise that prosecutions under the pharmacy acts in Philadelphia, New Jersey, Illinois and other States resulted in the conviction of the offenders, and that in those cases in which appeals were taken, the validity of the law was sustained by the higher tribunals.

OBITUARY.

FERDINAND HASSENCAMP, a prominent pharmacist of Baltimore, died in that city, April 29. He was a native of Marburg, Hesse-Cassel, where he was educated, and has been a resident of Baltimore for over thirty years. He took great interest in the Maryland College of Pharmacy, and served faithfully as Director and Examiner of this institution; he was also a member of the Board of Pharmacy and of the American Pharmaceutical Association, took an active part in the management of many charitable institutions and social societies, and secured a large circle of friends who valued him for his amiability in social intercourse and for his worth as a man.

Notice of the death of the following graduates of the Philadelphia College of Pharmacy has been received:

CHAS. S. LEE, class 1870, died in Philadelphia, of apoplexy, April 1, aged 37 years.

HORACE H. OWEN, class 1880, in business in Philadelphia, died at York, Pa., of typhoid fever, April 9.

FRED. LOOSE, JR., class 1880, was drowned in the Schuylkill river, near Philadelphia, June 17, at the age of 25 years.

ARTHUR E. LEWIS, class 1880, of Scranton, Pa., died at Santa Barbara, Cal., April 1, of consumption, aged 25 years.

JOHN G. SEITZ, class 1882, died at Cleveland, Ohio, June 21, after a lingering illness.

GEORGE W. ELDRIDGE, class 1863, in business in Philadelphia, died suddenly of heart disease, June 25, 1885.

THE AMERICAN JOURNAL OF PHARMACY.

AUGUST, 1885.

OLEATE OF MANGANESE.

BY C. E. KREYSSLER, PH.G.

Drs. Martin and McArthur having suggested the use of Oleate of Manganese as a menstrual stimulant, and as a remedy in functional amenorrhæa, menorrhagia and metrorrhagia, and not being able to obtain the same, requested me to make an attempt to prepare it, which I did, in the following manner, by acting on a solution of the sulphate of manganese, with a solution of sodium oleate: The powdered and dry Castile soap being considered a sufficiently pure sodium oleate, was used in making the solution; this solution was then gradually, and with constant stirring, aded to the solution of the sulphate of manganese, at once precipitating a granular appearing substance, being the oleate of manganese, which, on being slightly heated, suddenly changed to a sticky mass, having the consistency of putty, and this being washed several times with warm distilled water, to free it from the sulphate of soda, resulted in a hard substance having a light gray, slightly pinkish color, of a sweet musty taste, and peculiar odor, being sparingly soluble in alcohol, but soluble in ether, chloroform, olive oil and oleic acid.

To test this oleate a portion of it was oxidized on a platinum foil, and a fragment of caustic potash and same quantity of chlorate of potassium added, and held in a blowpipe flame until the fused mixture had become dark green, or the color of manganate of potassium, and on adding water to this, and boiling for a short time, it produced the solution of permanganate of potash, having the usual purple color.

The method of applying this oleate is as follows: About one teaspoonful of the 20 per cent. solution of the oleate is applied to the abdomen of the patient, and absorption promoted by friction, produced by vigorous rubbing of the surface with the palm of the hand, or fingers, continuing the rubbing until absorbed; it may also be applied to the spine, or inner surface of the thighs.

Dr. Martin recommends the application of the same in amenorrhæa,

if possible, every night for a week preceding the expected menstrual period, or at the time the menstruation is due, and until it makes its appearance, and in menorrhagia or metrorrhagia in smaller quantities, every night until the desired effect is produced.

Permanganate of potash in pill form has been used for the same purposes, without any noticeable effect, and was very objectionable to many, on account of the liability to act as an irritant to the stomach. The binocide of manganese has also been used, without effect, on account of its insolubility.

This oleate is highly recommended by Drs. Martin, McArthur and others, who have used it in their practice, and I would like to encourage others to give this valuable remedy a good and faithful trial.

CHICAGO, July 1, 1885.

ON THE INCOMPATIBILITY OF CHLORAL HYDRATE IN THE PRESENCE OF POTASSIUM BROMIDE AND ALCOHOL.

BY GEORGE F. H. MARKOE,

*Professor of General and Pharmaceutical Chemistry in Massachusetts
College of Pharmacy.*¹

In December, 1884, the writer had sent to him a bottle containing a mixture and a prescription, of which the following is an exact copy:

R. Bromide potass.....
Chloral hydrate..... \overline{aa} $\overline{5iii}$
Tr. opii et camph.....
Syr. Zingiber..... \overline{aa} $\overline{5iss}$

M.

Sig. One or two teaspoonfuls in half a wineglass of water every 2 to 6 hours. For sleep.

The claim was made by the physician that the pharmacist who dispensed the mixture had made a mistake, and the matter was put into the writer's hands for investigation. The mixture, as received, consisted of two layers, a clear dark brown liquid, floating upon a light-colored dense liquid. The dark-colored supernatant liquid had an intensely strong taste, in which the characteristic taste of chloral pre-

¹ Read before the Massachusetts State Pharmaceutical Association, Pittsfield, Mass., June 4, 1885.

dominated, but it was modified by the presence of ginger, camphor and anise, all of which could be recognized. On shaking the two liquids together a somewhat turbid mixture resulted; on standing, the two layers formed again.

The prescription was then made up, with the result that the ingredients separated into two layers, apparently in the same way with the mixture sent for examination. The writer could discover no practical difference in the two samples, and therefore concluded that some decomposition had taken place.

Anhydrous chloral (Trichlor-aldehyde C_2HCl_3O) is a thin, oily liquid, which will combine with an equivalent quantity of water to form chloral hydrate C_2HCl_3O, H_2O .

Chloral also combines with an equivalent of alcohol to form Chloral alcoholate C_2HCl_3O, C_2H_6O . Chloral alcoholate forms white needle-shaped crystals, is much less soluble in water than chloral hydrate, has a more disagreeable taste and is harsher in its action upon the system. When chloral hydrate was introduced into the practice of medicine, the writer was one of the first to make it in this country, and incidentally prepared and studied chloral alcoholate; two or three physician friends made trials of it, but found, that while it acted as an hypnotic, it was more disagreeable to the taste and harsh in its action, leaving unpleasant secondary effects. Knowing that chloral hydrate is changed into the alcoholate by solution in alcohol, it occurred to the writer that a similar decomposition had taken place in the mixture in question, the alcohol being furnished by the paregoric elixir called for in the prescription.

The following experiments were then made with a view to prove the supposition:

Exp. 1. Potassium bromide	60 grains.
Chloral hydrate.....	60 grains.
Water.....	6 fluidrachms.
Syrup of ginger.....	6 fluidrachms.

These articles formed a perfect solution which did not separate on standing.

Exp. 2. Potassium bromide.....	60 grains.
Chloral hydrate.....	60 grains.
Water.....	3 fluidrachms.
Alcohol.....	3 fluidrachms.
Syrup of ginger.....	6 fluidrachms.

In this experiment, it will be noted that the ingredients differ from the original prescription only in the substitution of diluted alcohol for the paregoric. After standing a short time this mixture separated into two layers, the upper layer being of a light straw color.

Exp. 3. This experiment was with the same ingredients used in No. 2, except that the alcohol was not added until after the mixture had been standing for an hour. No separation took place before the addition of the three fluidrachms of alcohol, but the separation occurred promptly after the addition of the alcohol. These experiments prove that the alcohol is the cause of the trouble, and the writer thinks that the chloral hydrate is changed into the less soluble chloral alcoholate.

In addition to the experiments which have been described numerous other ones were tried, which served to confirm the results of those named. The writer found that the addition of potassium bromide, sodium bromide, sodium chloride and magnesium sulphate to strong solutions of chloral hydrate together with the presence of alcohol determined a separation of the liquids into two layers. Ammonium chloride, ammonium bromide, potassium nitrate and calcium bromide did not disturb the same chloral solutions.

The practical lesson to be learned from this incompatible prescription, is that alcoholic preparations should not be prescribed with chloral hydrate, especially not in connection with the bromides of potassium and sodium, because if the solutions used are at all concentrated the chloral will separate as alcoholate, float on the surface, and a great risk will be incurred of giving a large overdose, the patient having received no caution with regard to the necessity of shaking the contents of the bottle before taking a dose.

DUNLAP'S DIARRHOEA MIXTURE.—

R.	Tincture of opium.....	
	Tincture of camphor.....	
	Tincture of peppermint.....	aa ̄ ss
	Tincture of ginger.....	̄ ij
	Tincture of capsicum.....	
	Hoffman's anodyne.....	aa ̄ ss

M. Dose, a teaspoonful diluted with sweetened water, after each operation. This is especially good in cholera morbus.—*New. Eng. Med. Monthly*, April, 1885.

PHARMACEUTICAL PREPARATIONS OF THE MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from page 291.)

A large number of the formulas are identical or nearly so with those admitted into the French Codex, or published in Dorvault's *l'Officine*. In the following we select only such which differ materially from, or are not contained in the works named:

Café de Bellotas, *Pulvis glandium quereus tostorum*.—Acorns deprived of the rind are heated in a coffee roaster, until they become brittle and have lost 28 per cent. in weight, when they are ground in a coffee mill. The powder is tonic and astringent and is used like coffee, the infusion being made with 15 Gm. to 1 liter of water.

Cápsulas medicinales, *Capsulæ medicatæ*.—Directions are given for preparing the empty capsules and for filling these as well as the so-called pearls. The material suitable for capsules is prepared by dissolving white gelatin 30, Irish moss paste 60, and honey in water 100 parts. If necessary greater flexibility may be imparted to the mass by adding a little glycerin.

Cataplasma anodina, *Cataplasma anodynum*.—Powdered bread crumb 125 Gm., powdered saffron 2 Gm., yolk of eggs 2, milk sufficient.

Cataplasma con subacetato de plomo, *Cataplasma cum Subacetate plumbico*.—Bread crumbs 60, Goulard's extract 30.

Cataplasma emoliente, *Cataplasma emolliens*.—Ground flaxseed, powdered round-leaved mallow, equal parts; hot water sufficient.

Cataplasms of belladonna, conium, hyoscyamus, stramonium, etc., are made in the same manner.

Cataplasma refrigerante, *Cataplasma refrigerans*.—Mix barley meal 185 with powdered red saunders 15 and add gradually oil of rose petals (see p. 287) 30, and sufficient strong vinegar.

Cerato de Bell, *Ceratum ex Bell*.—Melt together white wax 100, spermaceti 50 and cold-pressed sesame oil 400.

Cerato de Galeno, *Ceratum ex Galeno*.—White wax 200, sesame oil 600, lard 200, distilled rose-water 400.

Cerato simple, *Ceratum simplex*.—Like the preceding, omitting the rose-water.

Cervezas medicinales and *Cigarros medicinales* are the *Bières médicinales* and *Cigares médicaux* of French pharmacy.

Collodion morfinado, Collodium cum Chlorhydrate morphico.—Dissolve morphine hydrochlorate 1 in elastic collodion 30.

Crema fria, Ceratum cosmeticum anglicum.—White wax 30, sperm-aceti 60, cold-pressed sesame oil 215, rose-water 60, tincture of benzoin 15 Gm., attar of rose 6 drops.

Electuarium de Beleño opiado, Electuarium Hyoseymi opiatum.—Hyoseyamus seed 25, anise 25, fennel 25, castoreum 25, myrrh 25, Ceylon cinnamon 30, extract of opium 20, saffron 10; reduce to a very fine powder and incorporate with thick honey 1,000. Of this electuary 4 Gm. contain about 0.07 Gm. extract of opium.

Elixir de Jaborandi, Elixir de Pilocarpo pinnato.—Jaborandi 100, alcohol (60 per cent.) 600; macerate for 10 days, express, add simple syrup 400, and filter; strength 10 per cent.

Elixir de Coca del Perú is prepared in the same manner.

Emetina medicinal is the aqueous extract of the alcoholic extract of ipecacuanha.

Emplasto agglutinante, Emplastrum picis compositum.—Colophony 2,000, white copal 620, turpentine 250, sesame oil 150, white wax 120.

Emplasto de Belladonna, Emplastrum belladonnæ.—Exhaust belladonna leaves 250 with a mixture of ether 1 part and alcohol (60 per cent.) 4 parts, evaporate and incorporate with lead plaster 120 and Burgundy pitch 15.

The plasters of conium, hyoseyamus, digitalis, stramonium and similar drugs are prepared in the same manner.

Emplasto Cera católica, Emplastrum Cera catholica.—Yellow wax 500, turpentine 250, white copal 500, powdered bdellium 40, powdered olibanum 40, balsam of Peru 40.

Emplasto de Cimbron de Castilla, Emplastrum Lavandulæ compositum.—White copal 1,000, Campeachy wax 1,000, tar 375, sesame oil 100, sweet gum (liquidambar) 180, powdered allspice 120, and the volatile oils of lavender 4, cinnamon 0.5, cloves 1, organum 2, anise 2 and rosemary 2. Spread upon black paper, this plaster is known as *piel divina* (divine skin).

Emplasto de Cloral, Emplastrum cum Chloralo.—White wax and chloral hydrate, equal parts.

Emplasto confortativo de Vigo, Emplastrum catagmaticum ex Vigo.—Melt together lead plaster 3,250, Campeachy wax 500, and turpentine 250, and add the following in fine powder: olibanum, myrrh, sandarac, dragon's blood, red lead and Armenian bole, of each 120.

Emplasto de Estabillo de Puebla, Emplastrum ex Estabillo.—Melt lead plaster 1,600, Campeachy wax 180 and rosin 60, add soft galbanum 30, incorporate with the following in fine powder: ammoniac 30, olibanum 30, zinc oxide 30, dragon's blood 16, Armenian bole 15 and camphor 15, and mix with corrosive sublimate (dissolved in alcohol) 10, oil of rosemary 10 and oil of amber 10.

Especies amargas, Species amaræ.—Equal parts of the leaves of *Cirsium mexicanum*, *Artemisia mexicana*, and *Erythraea stricta*.

Especies aromáticas, Species aromaticæ.—Equal parts of orange flowers and of the leaves of *Artemisia mexicana*, rosemary, spearmint, sage, origanum and thyme.

Especies diaforéticas, Species diaphoreticæ.—Equal parts of the flowers of red poppy, borage, violet and elder.

Especies emolientes, Species emollientes.—Equal parts of the leaves of mallow and *parietaria*, and of the flowers of elder and *Gnaphalium canescens*.

Especies pectorales, Species pectorales. Horehound 5, yerba dulce (see p. 333) 15, *Adiantum tenerum* 15, liquorice root 10.

Three kinds of extracts of the narcotic herbs are recognized, namely, the inspissated juices, the aqueous made with boiling water, and the alcoholic prepared with alcohol of 60 per cent. The other extracts may be classified according to the menstruum used, as follows:

Cold water: juniper berries, fruit of *Cresecentia alata*, gentian, guaiac wood, opium, rhubarb.

Boiling water: cinchona, *Artemisia mexicana*, *Ambrosia artemisiæ-folia*, *Prosopis dulcis*, walnut leaves, senna, *Erythraea stricta*, *Millieria linearifolia*, and chamomile.

Alcohol 86 per cent. followed by alcohol 54 per cent.: *Fucus vesiculosus*.

Alcohol 80 per cent.: *physostigma*, *nux vomica*.

Alcohol 60 per cent.: cantharides, calinea root, ipecac, senega, sarsaparilla, colombo, valerian, squill, agaric, arnica, coea, jaborandi, cannabis indica, rue, savin, saffron, colocynth, poppy capsules, conium fruit, and the seeds of belladonna, colehicum, hyoseyamus and stramonium.

Alcohol 50 per cent.: lactnearium.

Glicerado are mixtures with glycerite of starch: sulphur in the proportion of 1:4, tannin 1:5, potassium iodide 4:30, and narcotic extracts

1:10. A solution is also officinal consisting of potassium iodide 5, iodine 1 and glycerin 40.

The gum resins of ammoniac, asafetida and galbanum are purified by emulsionizing them with about an equal weight of hot water, adding about half their weight of strong alcohol, pressing through rather coarse linen and evaporating by means of a water-bath.

Grajeas are granules, the strength directed being 0.1 Gm. for monobromated camphor, 0.05 Gm. for the valerianates of quinine, iron and zinc; 0.025 Gr. for ammonium valerianate; 0.01 Gr. for codeine and narcotine; 0.001 for arsenious acid, arseniates, strychnine, morphine and Homolle's digitalin; 0.0005 Gm. for aconitine, atropine and zinc phosphide; and 0.00025 Gm. for Nativelle's digitalin.

HISTOLOGICAL AND CHEMICAL EXAMINATION OF ANTHEMIS COTULA, LINNÉ.

BY GEORGE EDWARD HURD, PH.G.

From an Inaugural Essay.

After a full botanical description, the histology of the plant is described and illustrated by drawings, mostly microscopical, upon seven plates. In the older stem we usually find about twelve to fourteen wedges separated by rather wide medullary rays. The cambium line is very distinct. The rather thick bark is composed of an external layer of cubical cells, a row of rounded or elongated parenchyma cells, and several rows of incomplete parenchyma containing large quantities of chlorophyll. The bast fibers are comparatively large and are in bundles joined to the wood wedges which are composed of small, round thick-walled pleurenchyma, with numerous scattered ducts. The pith contains intercellular spaces and cells with acicular crystals of oxalate of calcium. Upon longitudinal section we find the ducts near the cambium line to be all spiral ducts, while those in the inner portions of the wood wedges are pitted. The oil glands are found in the disk florets, and also on the stem and leaves of the plant. Those of the florets are found sparingly in the petals usually near the margins, and appear like a globular mass raised above the other tissue; they are of a yellow color which, however, disappears on macerating the florets for some time in alcohol. In the leaves we find oil cells both on the upper side and on the lower surface. Those on the upper

surface are situated at the base of elongated cells, and are imbedded in the epidermal tissue; those on the under surface appear nearly globular, with irregular margins, and are imbedded in the irregular parenchyma tissue among the stomata, and somewhat resemble those found in the florets. Those of the stem are all found in the epidermal layer of the bark at the base of hair cells. The young hair cells are always found with one end attached to the outer tissue of the bark, but in the older cells they are all broken away and are simply fastened by their centre to a row of globular basal cells. These consist of a large, thick-walled oil cell, about two-thirds imbedded in the tissue of the bark, and from three to five smaller cells separated by thin walls; all probably containing oil. A solution of methyl violet was made by dissolving it in ether, after first mixing with a little alcohol, and upon treating the sections with this solution, the color was seen to enter the oil cells through the thin walls of the two upper basal cells, provided the hair was not broken, and then gradually pass downwards into the cells and the large oil cell, as well as upwards into the hair cell. When the hair cell was broken, the color, of course, passed directly into the hair cell and downwards into the others. From this it seems evident that the oil must be volatilized by the plant, through the thin walls of the upper cells.

The plant was analyzed by Wm. H. Warner (A. J. P., 1858, page 388), who found it to contain vol. oil, oxalic, valerianic and tannic acids, coloring matter, acrid fatty matter, bitter extractive, and salts of potassium, calcium, magnesium and iron. Pattone (ibid., 1859, p. 470) announced the discovery of an alkaloid anthemine, and of a crystallizable bitter acid, anthemidic acid (in *Anthemis arvensis*, L.—EDITOR). Because of the close botanical relation of the plant to *Anthemis nobilis* its volatile oil was supposed to be analogous, and worthy of examination; through the kindness of Dr. H. W. Jayne, I undertook the work in his laboratory under the supervision of Dr. F. L. Slocum.

Before beginning on the oil, the plant was examined with a view of determining, if possible, the presence of anthemine and anthemidic acid announced by Pattone. Accordingly six kilograms of the fresh plant were exhausted with hot water, and the resulting decoction evaporated to a soft extract. This extract was then digested with alcohol for some time, when about half of it was dissolved. The resulting alcoholic solution with appropriate treatment yielded a small amount of a white crystallizable acid possessing a bitter taste and an

acid reaction, and formed salts with calcium and potassium. The undissolved portion of the extract was then dissolved in water, and with appropriate treatment yielded a very small amount of crystallizable alkaloid, which gave copious precipitates with Mayer's test and bromine water.

Extraction of Oil.—A portion of the fresh flowers was first distilled with about 25 liters of water in successive portions of about 5 kilograms until 30 kilograms of the flowers had been distilled. The oil was entirely dissolved in the water and failed to separate, even after standing in a cool place for several days. It was then extracted with ether, the ethereal solution dried thoroughly with chloride of calcium, and the ether distilled off, when a residue of about 4 grams of the oil was obtained. It was of a beautiful green color, which was undoubtedly due to chlorophyll extracted along with the oil. The ether was then recovered from the water used in the first distillation and the water again distilled with more flowers. Successive portions of about 4 kilograms of the fresh flowers were used, and enough water added from time to time to keep the amount at 20 liters. Eleven charges were distilled in this way, and 46 kilograms of the flowers used before any oil made its appearance on the surface of the water, and then only a very minute quantity was observed. The oil was then extracted with ether, as before, and the ether distilled off, when about 6 grams of the oil was obtained. This oil was of a deep straw color or brown. The total amount of oil obtained from 76 kilograms of the flowers was 10 grams, or .013 per cent., equal to about .052 per cent. from dried flowers.

A third distillation was also made in the month of August, while the plant was fully in blossom, using the whole fresh plant. This was distilled in successive portions of about 20 kilograms, with about 60 liters of water, until 175 kilograms had been distilled. After the fifth portion had been distilled a very small amount of oil was observed on the surface of the water at each distillation, but not enough so that it could be removed. The whole of the distillate finally had to be extracted with ether as before, and after drying the ethereal solution and distilling off the ether, about 17.5 grams of the oil was obtained, or about .01 per cent. This oil was a trifle more reddish in color than that obtained from the flowers, but proved to be identical with it. The oil seemed to be partially decomposed by continually redistilling the distillate with more of the plant, in the above manner; for the

distillate possessed a disagreeable smell, differing somewhat from that of the oil when pure and dry, and had a decided acid reaction.

The oil thus obtained possessed a strong ethereal odor, somewhat resembling that of the plant, a bitter, acrid taste, an acid reaction and the sp. gr. 0.858 at 26°C. A portion of the oil was distilled alone, when about 30 per cent. came over between 120° and 200°C., about 30 per cent. from 200° to 280°C., the remainder decomposing at this point, leaving about 40 per cent. as a black, tarry residue. A saponification of the oil was then made, using the process adopted by Fittig in his analysis of the oil of *Anthemis nobilis* ("Annalen der Chemie," 195, p. 79). The oil was first mixed with from fifteen to twenty times its volume of alcohol and saturated alcoholic solution of potassium hydrate added until the solution was alkaline. It was then boiled on a return cooler for about ten hours; the solution was then of a dark brown color and the oil seemed to be entirely decomposed. The alcohol was then distilled off, and the residue dissolved in distilled water. This aqueous solution smelled very much like rose-water and contained a large amount of flocculent matter which would not dissolve even on heating. Water was then distilled off, oily drops coming over with the distillate, more water was added and distilled as long as oily drops came over (distillate *a*). The residue in the flask, consisting of the potassium salt of the acids, was decomposed by adding dilute sulphuric acid (sp. gr. 1.25) until it was slightly acid, a brown, oily substance separating and rising to the surface, where it solidified. More water was then added and distilled off as long as an acid distillate was obtained (distillate *b*). A brown resinous matter remained in flask and would not distil over, probably due to a portion of the oil being decomposed. The acid distillate *b*, was then heated to boiling and an excess of calcium carbonate gradually added; the liquid was well boiled, filtered, concentrated and set aside, when a small amount of fine white crystals were obtained. These were purified by recrystallization and dried, decomposed with very dilute sulphuric acid, the liquid extracted with ether and this evaporated to crystallize. Several decompositions were made both of the oil from the plant as well as that from the flowers, giving similar results. Considerable difficulty was experienced in obtaining the acid in the pure state, as it polymerized easily and a great deal was lost by recrystallizing and decomposing the calcium salt.

Relatively large amounts of the same acid crystallized on exposing

the oil to a temperature of about 10°C. These crystals were drained on a filter, carefully washed with ether, converted into potassium salt and from the solution the adhering oil was extracted with ether. The potassium salt was then decomposed and the free acid extracted with ether and crystallized from its ethereal solution, when it was obtained quite pure. The acid possessed a strong, disagreeable smell, entirely free from any valerianic acid odor, and melted at 58°C. A portion of it was mixed with a large excess of concentrated HBr when it immediately combined and yielded a bromated acid, which upon oxidization with nitric acid yielded hydrobromic acid. The acid was also treated with hydriodic acid and amorphous phosphorus when the characteristic odor of valerianic acid was produced on heating. The oily distillate *a*, obtained in the decomposition of the oil and probably containing the alcohols, was extracted with ether and yielded, on evaporating off the ether, a light straw colored oily liquid to the amount of about 30 per cent. of the oil used. A portion of this was distilled, when about 40 per cent. came over between 185° and 240°C. and was of a light straw color, while about the same amount came over from 240° to 290°C. and was of a dark brown color. The remainder, about 20 per cent., formed a solid, black, resinous mass. A portion was then treated with about five times its volume of concentrated hydrobromic acid (saturated at 0°C.), but it would not combine. Another portion treated with metallic sodium gave off hydrogen, and united to form a sodium compound which upon treating with water again decomposed into the alcohols and formed caustic soda.

A MUSTARD-SPONGE.—In referring to sponge as a carrier of poultices, Dr. Richardson considers that it makes the best of mustard carriers. The nurse mixes the mustard in a basin with water until the mass is smooth and of even consistency. Then she takes the soft mass all up with a clean sponge, lays the sponge in the centre of a soft white handkerchief, ties up the corners of the handkerchief neatly to form a hold, and applies the smooth convex surface to the skin. This mustard sponge, warmed again by the fire and slightly moistened, can be applied three or four times, is good for several hours, and saves the trouble of making a new poultice for re-application, often a matter of importance during the weariness of night watching. The sponge can afterward easily be washed clean in warm water. It is scarcely necessary to add that this method will save both time and trouble, and that the same sponge may be used frequently.—*Jour. Am. Med. Assoc.*, June 13, 1885.

THEORETICAL OBSERVATIONS ON ANTHEMIS COTULA.

BY DR. F. L. SLOCUM.

The microscopical examination shows enough oil cells to warrant a much larger yield of oil than was obtained by Mr. Hurd, and that a much larger amount of oil is present is proved by the easy decomposition of the oil, and the polymerization of the acid. The condensation of the acid into resin occurs so easily that in order to make a thorough examination, over four tons of the plant would have to be distilled. The oil even decomposes by distilling the plant as shown by its acid reaction, it undoubtedly being a neutral ether at first. The acid is an unsaturated acid closely allied to angelic and tiglinic acids ($C_5H_8O_2$). It combines with HBr directly to a bromine compound. It decomposes into valerianic acid by gently warming its calcium salt, or heating it with HI and red phosphorus, similar to angelic acid ("Asher, Ber.," 2, p. 685), also by distilling the oil with dilute H_2SO_4 it passes into valerianic acid, as shown by Warner, who supposed the plant really contained valerianic acid, but in reality this acid was only a decomposition product. However, these reactions show that the acid obtained is isomeric with angelic acid.

The alcohols obtained were saturated alcohols, as proven by Mr. Hurd's experiments. Apparently a large portion of them was hexyl-alcohol, $C_6H_{14}O$. The highest boiling portion resembled Fittig's anthemol ("Annalen," vol. 195, p. 104). The alcohols below hexyl-alcohol are present in very minute quantities if present at all. It is much to be regretted that enough of the oil could not be obtained so that definite quantitative results could have been given; but the results as far as ascertained by Mr. Hurd, conclusively prove that the oil of *A. Cotula* is a compound ether very closely allied to the oil of *A. nobilis*, hence proving its close family connection and showing it to be a compound ether composed of the same series of acids and alcohols. In fact the compounds of the oils are so nearly identical that the relation of the plants could be identified by an examination of the oils alone.

PREVENTION OF CHRYSAROBIN STAINING.—The staining of the clothes caused by chrysarobin may be prevented by making the latter into a dough with water, and after applying to the diseased spot, covering it with a layer of collodion.—*Birmingham Medical Review*; *Cinc. Lancet*.

GLEANINGS FROM FOREIGN JOURNALS.

BY J. ROBERT MOEHEL.

Casein Cement.—Mr. Kayser (Mitth. d. Bayer. Gewerb.) recommends this cement as cheap and excellent as to its adhesiveness, especially in cases where gum arabic cannot be replaced by dextrin. Heat milk, precipitate with tartaric acid, collect the precipitate and dissolve while moist in a watery solution of 6 per cent. borax.—*Rundschau, Leitm.*

Cement for China.—Dissolve three parts of freshly precipitated casein in one part of silicate of sodium.

Excellent Mucilage.—To 250 Gm. of a concentrated solution of acacia (2 p. in 5 p. water) add a solution of 2 Gm. of crystallized sulphate of aluminium in 20 Gm. of water. Alum in place of the salt mentioned may be used, but gives less satisfaction. For decolorizing mucilage, freshly precipitated hydrate of aluminium is recommended. The ordinary mucilages, particularly if very concentrated, often fail in their object by merely wetting without causing to adhere, pasteboard to pasteboard, wood to wood, or a metal surface, and without cementing glass, china, pottery, etc. The addition of aluminium sulphate is recommended as sufficient to impart to a concentrated mucilage the desirable adhesiveness. Mucilage intended for pharmaceutical purposes should not be clarified as stated above, since in mixtures a reaction with aluminium may take place.

Pilules Dehaut.—The composition of these pills is said to be equal parts of aloes, scammonium and colocynth. Dorvault gives their composition thus: Aloes, gamboge and extract of dandelion.

Alimentary Solution for Plants.—Potassium nitrate 10 Gm., calcium carbonate 5 Gm., sodium chlorate 5 Gm., calcium phosphate 5 Gm., sodium silicate 5 Gm., ferrous sulphate 15 Gm., to 100 liters of water.

Stain for Ivory.—To impart a brownish tint to ivory, place it in a very dilute solution of nitrate of silver, dry and expose it to the sun; if desired to impart a reddish tint treat a second time with a very dilute solution of auric chloride. Pyrogallie acid is also adapted for the purpose.—*Ph. Ztg.*

Separation of Copper and Cadmium.—M. A. Béhal states that the following easy method may be used for quantitative analysis: If to a solution of a copper and a cadmium salt a strong alkaline solution of sodium tartrate is added no precipitate is formed except a faint tur-

bidity disappearing while shaking. On boiling this solution all the oxide of cadmium is precipitated while the copper is retained in solution. The white $\text{Cd}(\text{OH})_2$ which settles rapidly, is collected, washed with a little water and dissolved in NH_4OH , and this ammoniacal solution, treated with ammonium sulphide or H_2S , gives the characteristic yellow precipitate of CdS . Ammoniacal salts prevent precipitation; in this case the solution of the tartrate is rendered strongly alkaline and then boiled, when the ammonia escapes and the precipitate is formed.—*Rép. de Pharm.*, No. 6, 1885.

Quantitative Valuation of Resin in Soap.—The method is based upon the behavior of NaCl to separate out of a solution of soap, only the fat soap, while the resin soap is retained in solution. Dr. Heiner's experiments made with soap containing 20 per cent. of resin, gave on an average $1\frac{1}{2}$ per cent. less of resin. Two samples of equal weight are treated; one is decomposed with H_2SO_4 , and the fatty acids containing the resin are weighed. Dissolve the other sample in water, treat with solution of NaCl , separate the liquid containing the resin and glycerin from the soap-mass, wash with solution of NaCl , dissolve again in water, precipitate again, wash repeatedly with the salt solution, and decompose the pure soap with H_2SO_4 , and weigh. The difference in weight of the two results gives the weight of resin.—*Monit. Scientif.*; *Centralhalle*, No. 25, 1885.

Detection of cane sugar in sugar of milk.—If a mixture of equal parts of oxalic acid and sugar of milk be warmed over the water-bath, the mass melts and assumes a faintly darker coloration on being heated for some time. In case the mixture contains but one per cent. of cane sugar, it darkens very rapidly, changing from greenish brown to black in the presence of a larger percentage of cane sugar. This method was first proposed by Lorin in "*Ph. Zeitsch. f. Russland*," xvii, 372, and is recommended as a reliable one in "*Phar. Centralh.*," No. 22, 1885, p. 244.

Estimation of milk sugar and cane sugar.—The method of A. W. Stokes and R. Bodmer is especially adapted for milk, and requires an ammoniacal Fehling's solution, prepared as follows: Dissolve crystallized sulphate of copper 34.65, Rochelle salt 170, liquor potassæ 170, in sufficient water to make one liter. To 120 cc. of this solution add 400 cc. ammonia (spec. grav. 0.880), and dilute to one liter. This ammoniated cupric fluid constitutes the *Pavy solution*, of which 10 cc. correspond to 0.005 Gm. of glucose; it is advisable to standardize it

with inverted cane sugar. The saccharine liquid or the sufficiently diluted milk is first titrated in the ordinary way. Then another portion of the milk is boiled with two per cent. of citric acid during ten minutes—which operation inverts all the cane sugar—the liquid when cool may be tritrated. The first result gives sugar of milk alone, the second also the inverted cane sugar, and thus the percentage of both sugars is easily calculated.—*Analyst*, April, 1885, p. 62.

Neutral Salicylate of Atropine is said to be a more valuable salt than the sulphate, and superior to the latter. Its preparation is not difficult, but the exact neutralization is very important. The necessary proportions are: Atropine 2.30 Gm., salicylic acid 1.08 Gm., and sufficient alcohol, but exact neutralization should be insured by testing with delicate test-paper. Dissolve the atropine in the alcohol by means of a gentle heat, add slowly in minimal quantities the salicylic acid until absolutely neutralized, and filter if necessary. Evaporate carefully over a steam or water-bath to a syrupy consistence, and dry at a very gentle heat. The powder is hygroscopic, and the watery solution (as most of the alkaloids) very unstable on account of the formation of a species of algae (*Leptomitus Higroeroeis*).—*Progresso*, March; *Ph. Ztg.*, No. 41, 1885.

Remedy for Warts.—Among other remedies, carbonate of magnesium has been recommended, especially in cases where the warts are very numerous; a teaspoonful of it is to be taken three times a day for two or three weeks, and is said to effect a sure cure. The warts may also be touched with crystallized carbolic acid, of which a small crystal is placed on the wart and allowed to be absorbed. In addition to this treatment carbonate of magnesium is recommended to be taken internally.—*Ph. Ztg.*, No. 38, 1885,

WHOOPING COUGH MIXTURE.—Dr. A. Platt has found the following mixture to answer an excellent purpose:

R	Copaibæ.....	
	Balsam. Tolut.....	
	Pulv. Acaciæ.....	aa ʒ ss
	Aquæ.....	ʒ iv
	Acid. sulphuric. aromat.	gutt xx

Mix the acacia with the balsams and gradually add the acidulated water.

Dose, a teaspoonful when required, three, four, or five times a day.—*New Eng. Med. Monthly*, April, 1885.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from p. 343.)

Banderilla, *Læselia cærulea*, *Cavanilles*; nat. ord. Polemoniaceæ. The plant grows near Guadalupe, Pachuca, etc., and is commonly employed as a diaphoretic, emetic and cathartic.

Barbas de chivo, *Clematis sericea*, *De Cand.*, Ranunculaceæ; in the mountains of Pachuca. The bruised leaves applied to the skin for a few minutes are rubefacient, and by longer contact produce blisters and superficial ulceration; the dried leaves are destitute of these properties.

Bellota, the fruit of Mexican oaks, is used as an astringent. Dose, 12 to 15 Gm. of the powder; the decoction 15 to 30 Gm. to one liter of water.

Berros. Under this name several plants are used for their antiscorbutic and diuretic properties, namely, *Nasturtium officinale*, *De Cand.*, *Nast. amphibium*, *De Cand.*, *Sium angustifolium*, *Lin.* (also known as berra or berraza), and *Tropæolum majus*, *Lin.* (also known as mastuerzo).

Betabel. The leaves of the cultivated *Beta vulgaris*, *Lin.*, are laxative and emollient.

Betónica. In Mexico, *Betonica Alopecurus*, *Lin.*, is somewhat employed as a stimulant, sialagogue and sternutatory.

Boconia, *Bocconia frutescens*, *Lin.*, Papaveraceæ; in Michoacan and other hot districts. The milkjuice, in doses of 12 to 24 drops, is used as a purgative and anthelmintic, and, mixed with water, as an application for ulcerated eyelids; the boiled and bruised leaves as vulnerary cataplasms. The extract may be used for dyeing, the colors being handsome and lasting. An analysis appears not to have been made; the milkjuice being of a yellow color, it probably contains the same or similar constituents as celandine.

Boldo, *Boldoa fragrans*, *Jussieu*; Monimiaceæ; from Chili. Used in affections of the liver and kidneys.

Bolontibi, *Cissus acida*, *Lin.*, Vitaceæ; in Yucatan. The acidulous and mucilaginous leaves, bruised, are employed in itch, tinea and other cutaneous affections; also as a maturative.

Borraja, *Borago officinalis*, *Lin.*, naturalized in fields in Mexico. The leaves and flowers are occasionally used as a stimulant and sudorific.

Brea, the residue from the distillation of turpentine. Two kinds are distinguished in Mexican commerce: 1. Brea de Penca; congealed in moulds of magney leaves, it forms elongated planoconvex cakes, yellow, glass-like, transparent and brittle. 2. Brea de Marqueta; in cubical cakes or broken, more or less opaque, blackish brown, somewhat empyreumatic.

Butua, *Cissampelos Pareira*, *Lamarck*, Menispermaceæ, near Chilpancingo, in the State of Guerrero, etc. The root is fibrous, hard, externally brown, internally yellowish gray, the cross section showing concentric, easily separable layers; inodorous; taste sweet, afterwards bitter; reputed to possess diuretic properties. The juice of the leaves is used against snake bites.

Cabalonga (the seeds of *Strychnos Ignatii*, *Bergius*), Cacao, Café, Cálamo aromático (calamus), Canela (cinnamon), Cardamomo menor (cardamom), Cascarilla, Castóreo (castor), Catecú, Cebada (barley), Cebolla (onion), Cera de abejas (beeswax), Cicuta mayor (*Conium maculatum*), Cidra (*Citrus medica*), Ciruelo de España (prunes), Clavo de especia (cloves), Coca de Levante (*cocculus indicus*), Coca del Perú (coca leaves), Cochinilla (cochineal), Cola de pescado (isinglass, in Mexico also obtained from *Silurus Bagre* and other fishes), Cólehico (tuber and seeds), Colombo, Coloquintida (colocynth), Comino (cumin), Cubeba, Cuernecillo de centeno (ergot), Cuerno de ciervo (hartshorn, from *Cervus mexicanus*, etc.), Culantro (coriander), Cúrcuma, Cuso. These drugs, well known in our commerce, have been admitted.

Cacahuatate, *Arachis hypogæa*, *Lin.*; Leguminosæ. The seeds are used as an aliment and for preparing the fixed oil; the root is commonly used as a substitute for liquorice root.

Cacaloxochitl, *Plumiera rubra*, *Lin.*, Apocynaceæ; in Morelos, Yucatan and other hot districts. The flowers are pectoral; the juice is used for certain ulcers and for destroying warts.

Cacomite, *Tigridia pavonia*, *Persoon*; Iridaceæ; in Central Mexico. The bulb is rich in starch, and is boiled and used for food; among common people it enjoys the reputation of being febrifuge.

Cainca, *Chiococca anguifuga*, *Martius*; Rubiaceæ; Brazil, etc. The Mexican cainca is *Ch. racemosa*, *Jacquin*, which, with other roots, is known in Brazil as puaia (poaya), and in Cuba as bejuco de verraco.

It is emetic and purgative; dose, 0.5 to 2.0 Gm., the extract 0.3 to 1.0 Gm.

Calabaza, *Cucurbita maxima*, *Duchesne*, and *C. Pepo*, *Lin.* The flowers and fruit are alimentary; the seeds, particularly those from the hot districts are tæniifuge in the dose of 60 Gm.

Calaguala is the name given to the rhizomes of different species of ferns, principally *Polypodium aureum*, *Lin.*, having diaphoretic and pectoral properties, and used in decoction and powder; dose, 2 to 4 Gm.

Calancapatle, *Solidago montana*, *Flor. Mex. ined.*; the powder as a vulnerary in atonic ulcers; the decoction in lotions. Similar uses are made of *Doronicum glutinosum*, *Willd.*, and *Grindelia glutinosa*, *Dunal*, known as Calancapatle de Puebla.

Camote, *Batatas edulis*, *Choisy*; *Convolvulaceæ*. The leaves are used for fodder, the roots as food, and the starch as a substitute for arrowroot. The tubers of *Oncus esculentus*, *Loureiro*, *Dioscoreaceæ*, are known as Camote the cerro, and on account of the large quantity of starch are used for food.

Canchalagua, *Erythraea stricta*, *Schiede*, *E. chilensis*, *Persoon*, *E. jorullensis*, *Kunth*; *Gentianaceæ*. Stem slender; leaves oblong-linear, rather obtuse; inflorescence in dichotomous panicles; corolla-lobes 4 or 5, elliptic-oblong; stigma cleft; capsule two-celled. Among other constituents Lebeuf (1868) found 9 per cent. of bitter principle. The flowering tops are used as a bitter tonic and stomachic; dose, 15 to 30 Gm. in 500 Gm. infusion.

Cántaridas. A number of Mexican beetles are employed as substitutes for cantharides, of which the following are the most important:

Triodons Barranci, *Duges*, *M. tridentata*, *Lin.* The male is 18 mm. long and 7 mm. broad; the female 44 mm. long and 10 mm. broad; color black; jaws prominent, on the inside with three strong teeth; antennæ moderate, the second joint very short, the eleventh elongated and thin at the extremity; thorax small, narrower than the elytra and head; wing cases covering the greater portion of the abdomen of the male, and scarcely the second abdominal ring of the female; abdomen voluminous, soft; legs long and stout; claws yellowish, bifid. The insect is collected from June to September.

Cantharis encera, *Cher.* Length 30 to 18 mm., width 9 to 4 mm.; head black, the upper half red; antennæ black, moniliform in the female, the fourth to sixth joints trigonal and somewhat dilated; tho-

rax a little broader than and about half the length of the narrow, smooth and glossy black wing cases; abdomen black, in the male the upper part red from the second to the last but one segment, and near the centre with five black dots; lives on pumpkin and other cucurbitaceæ.

Mendoza and Herrera proved these insects to contain cantharidin and other constituents of Spanish flies. The indigenous species of *Triodons* and *Meloe* were found to be more active than those of the genus *Cantharis*. For description, etc., see "*Gaceta Médica*," 1866, vol. ii, and "*La Naturaleza*," vol. i.

Cañafistula, *Cassia fistuloides*, *Flor. Mex. ined.* The fruit is 20 to 60 cm. long, indehiscent, has two longitudinal bands, and its chambers are filled with a black saccharine pulp, containing yellowish flat rhomboidal seeds. 100 parts of fruit yield 445.52 parts of pulp. The fruit of *Cassia brasiliensis* is also met with in the Mexican commerce.

Cañamo. The fruit of *Cannabis sativa*, *Lin.*, is used in the form of an emulsion in inflammations.

Cañuela or Cola de caballo, *Equisetum arvense*, *Lin.*; used as a diuretic and antiblemnorrhagic.

Caoba, *Swietenia Mahogoni*, *Lin.*; *Cedrelaceæ*. The bark is antiperiodic and astringent; dose 2 Gm.

Capitaneja, *Bidens* (*Platypterus*, *Kunth*; *Verbesina*, *De C.*) *crocata*, *Cavanilles*; *Compositæ*. In the valley of Mexico, southwest of the capital. Stem stout, four-winged, villous; leaves opposite, villous, the lower ones halbert-shaped, the upper ones pinnatifid and dentate; flowers terminal and axillary, long-peduncled, with the involucre globose, the tubular florets reddish yellow, and the akenes oblong, compressed, two-awned and membranous on the margin. Instead of this plant *Helianthus alatus*, *Flor. Mex. ined.*, is sometimes collected, which has alternate and dentate leaves, a terminal inflorescence and yellow flowers. The decoction is used as a wash for venereal ulcers, together with the powdered leaves; also for curing the sores of beasts of burden.

Capulin, *Cerasus Capollin*, *De Candl.*; grows in temperate regions of Mexico. The fruit is edible; the distilled water of the leaves is a substitute for cherry laurel water; the bark is antidysenteric and antiperiodic; dose 1 to 2 Gm.

Caraña, *Amyris Caranna*, *Humboldt*, *Terebinthaceæ*. In the hot

districts of Mexico the tree yields a resin which is externally dark gray, internally dark brown, when heated of a balsamic odor, of a bitter resinous taste, completely soluble in alcohol; it is only used in plasters.

ANALYSIS OF THE LEAVES OF ILEX CASSINE.

BY F. P. VENABLE, PH. D.

The Yopon (*Ilex Cassine*, Linn.), is described in Hale's "Woods and Timbers of North Carolina," as an elegant shrub ten to fifteen feet high, but sometimes rising into a small tree twenty to twenty-five feet. It has, according to the same authority, for its *habitat* the strip of country from Virginia southward along the coast, never extending, however, very far into the interior. The leaves are one half to one inch long, with a smooth surface, and fine serrated edge. The plant is an evergreen, and its dark green leaves and bright red berries make it attractive as an ornamental shrub. In the region of the Dismal Swamp, and in other sections the leaves are annually gathered, dried, and used for tea. This decoction is, according to Hale, oppressively sudorific, at least to those unaccustomed to its use. The famous "Black Drink" of the Southern Indians was made from the leaves of this shrub. "At a certain time of the year they come down in droves from a distance of some hundred miles, to the coast for the leaves of this tree. They make a fire on the ground and putting a great kettle of water on it, they throw in a large quantity of these leaves, and seating themselves around the fire, from a bowl that holds about a pint, they begin drinking large draughts, which in a short time occasions them to vomit freely and easily. Thus they continue for the space of two or three days, until they have sufficiently cleansed themselves, and then every one taking a bundle of the leaves, they all retire to their habitations." Having on hand a small sample of these leaves procured from New Berne during the winter of 1883, it seemed desirable to make an examination of them to decide, if possible, the presence of any alkaloid or other principle which would make the decoction useful as a beverage. The usual treatment with magnesium oxide, exhaustion with water, separation by means of chloroform and subsequent purification, was adhered to, resulting in obtaining a small amount of a white substance slightly soluble in water, more so in alcohol, and

easily soluble in chloroform, which gave distinctly the tests for caffeine, especially the murexide reaction, and very closely resembled a specimen of pure caffeine from Powers & Weightman.

This caffeine formed .32 per cent. of the dried leaves. Later on, in May, a much larger supply of the same leaves was gotten from the neighborhood of Wilmington. A more thorough examination of them was then made with the following results:

Water in air-dried sample.....	13.19
Extracted by water.....	26.55
Tannin.....	7.39
Caffeine .....	.27
Nitrogen (on combustion).....	.73
Ash.....	5.75

The analysis of the ash is shown in column I.

	I.	II.
CaO.....	10.99	12.34
MgO.....	16.59	11.39
Na ₂ O.....	.47	7.28
K ₂ O.....	27.02	2.98
MnO ₂	1.73	2.50
Fe ₂ O ₃.....	.26	3.41
SO ₃	2.50	.92
Cl.....	.66	.71
P ₂ O ₅	3.31	5.54
SiO ₂	1.32	44.75

The Maté or Brazilian Holly (*Ilex Paraguayensis*), belongs to the same genus. Its ash analysis, as made by Senor Arate, is given in column II. The plant grows wild in Brazil and is very largely used by the South Americans. It has, according to Peckolt ("Phar. Jour. Trans." [3], 14, 121-124, "Am. Jour. Phar.," 1883, p. 570), been planted, and seems to succeed well, in the Cape of Good Hope, Spain and Portugal. It is stated that six different species of ilex are used in the preparation of this tea. Peckolt gives, in his analysis of the air-dried leaves, the percentage of caffeine as .639. The average percentage of analyses, by different authors, is about 1.3. I can find mention of only one other ilex used as a substitute for tea. The analysis of this by Ryland and Brown is quoted in Blythe's "Composition and Analysis of Foods," p. 343. It is called the *Ilex Cassiva*, is said to be used as a tea in Virginia, and the percentage of caffeine is given as .12. This is probably the same thing as the Yopon, the analysis of which is given above, and the "cassiva" may be a misprint for "cassine."—(See Analysis by Henry M. Smith, in *Am. Jour. Phar.*, 1872, p. 216.)

THE ESTIMATION OF MORPHINE IN OPIUM.

BY J. HOWARD WAINWRIGHT, PH. B.

As one of the chemists connected with the United States Laboratory at the port of New York, my attention has been in a large measure directed to the assaying of opium, samples of which, from every case entered here, are sent to this laboratory for the estimation of morphine.

The literature upon this subject is very voluminous, probably more so than that relating to the assay of any other drug, and comprises the descriptions of many methods.

The requirements of a method adapted to the work of this laboratory are, rapidity of manipulation, simplicity of the apparatus and, most important of all, accuracy of results. I have, therefore, undertaken an investigation of this very interesting subject, the purpose of which has been, not to test all of the methods published, but simply to try some of the most general and to compare them in order to find one, or the essential features of one, which best meets the above demands.

There are not many different varieties of opium imported at this port, by far the largest amount being Smyrna or Turkish, occasionally some Persian, and very rarely small amounts of Egyptian and Indian—these latter usually in sample lots. The total number of samples assayed during the year ending December 30, 1884, was four hundred and one, the percentage of morphine being generally between 9 and 15, some few samples of Persian opium yielding as high as 18 per cent. and two or three samples of Smyrna yielding less than 9 per cent. As the law prohibits the importation of the drug showing less than this proportion of morphine, such cases as the latter are rare. Assays are made upon samples as they are received from the official drug examiner. When the percentage is over 15 per cent. or under 9, duplicate determinations are invariably made.

The sampling of opium for the morphimetric assay is a matter of great importance, especially when the drug is in the moist commercial condition.

The best method, and the one usually employed for sampling a case, is described by Dr. Squibb in his *Ephemeris*, Vol. i, No. 1, as follows: "About every tenth lump of a case should be sampled by cutting out a cone-shaped piece from the middle of the lump with an ordinary pocket knife. Then, from the side of each cone, a small strip is taken

from point to base, not exceeding half a gram from cones which would average 10 to 15 grams, and the cone is then returned to its place in the lump. The little strips are then worked into a homogeneous mass by the fingers, and the mass is wrapped in tin foil, moist cloth or paper to prevent drying, until it can be weighed off for assay." This sample obtained from the case should not be less than 100 grams, and should be sampled down to the convenient weight to be taken for assay. This is quite important, as I have found that the morphine contained in pieces taken from different parts of the same sample lump frequently varies as much as 1 or more per cent. Also, whilst some opiums may be "worked into a homogeneous mass by the fingers," as above, in others this will be found very difficult, if not impossible, as they may be either too moist and sticky or too hard and dry. I am, therefore, in the habit of sampling the large sample lumps in one of three ways, according to the condition of the drug. If quite moist the ball is flattened out and small portions are taken from every part on the end of a penknife until the required weight is obtained; or, whenever possible, a thin section is cut through the middle of the ball, and from this the sample is taken from around the edges and from the centre, and when the opium is hard and dry, or where great accuracy is required, the ball is broken up in a mortar as finely as possible, weighed and dried, the moisture being determined from the loss in weight. It is then powdered and thoroughly mixed, and the proper quantity weighed off.

The method of assay formerly in use here is, perhaps, the most simple, being little more than a rough estimation of morphine, yielding results which are at best only approximate, and not in any way to be relied upon where great accuracy is required. However, as it is extremely simple, and, with a little practice, easy of manipulation, it may be worthy of a brief description. Ten grams of the sample are weighed off into a porcelain mortar and allowed to macerate about twelve hours or over night with 50 cc. of hot water. It is then thoroughly mixed with the pestle and the mass transferred to a linen or flannel filter of convenient size with as little hot water as possible. The filtrate is allowed to run into a flask, accurately marked at 100 cc., and when all that will has run through the filter and contents are squeezed between the fingers until most of the extract is expressed; it is then moistened with a little hot water and again expressed as above. This moistening and expressing is repeated until exactly 100 cc. of

extract and washings are obtained. If the extract comes through cloudy, which is sometimes the case, it will have to be refiltered through paper. The paper is then washed, and the extract, then more than 100 cc., must be concentrated to that volume or exactly one half taken. If the extract in the flask is exactly 100 cc., as it should be, it is well shaken to insure thorough mixture and allowed to stand and settle for about one hour; 50 cc., representing 5 grams, are drawn off with a pipette and transferred to a small beaker, a very slight excess of a solution of equal parts of ammonia and alcohol is added, and the liquid well stirred and allowed to stand over night, when the impure morphine will crystallize out. These crystals (which it will often be found necessary to detach from the sides of the beaker with a small steel spatula) are collected upon a tared filter and washed with a little cold water, applied drop by drop around the edges of the filter, until it runs through almost colorless. The filter and contents are now dried at a temperature not exceeding 100° C., and washed with about 25 cc. of ether to remove the narcotine, again dried and then weighed. From repeated experiments 85 per cent. of this weight was found to represent approximately the weight of the morphine.

The only advantages of this method are its extreme simplicity and economy of time. It was originally adopted because of the very great number of samples which then required daily examination. In ordinary cases its disadvantages, however, were found to be many. It is only applicable to a moist opium, as this is the only one which will yield an extract running clear through the linen or flannel filter. It is also difficult to extract the opium completely in this manner with 100 cc. of water; at least double that amount is required. This increased volume, however, would involve the necessity of concentrating the liquid, which, otherwise, would be too dilute, and thus time would be lost. The precipitated morphine (it can hardly be called crystallized) is always very impure and dark colored and requires a great deal too much water to wash it, and always carries with it a large proportion of narcotine which the ether will not remove unless a large quantity is used, and then only imperfectly; the precipitate usually forming large, hard lumps. It is also difficult to remove all the precipitate from the sides of the beaker, which, however, would make no difference if the beaker were tared. The time occupied by this method is ordinarily about forty-eight hours, and not more than five, or at most eight samples can be conveniently run at the same time. Having used this

method for upwards of six months and finding it not at all satisfactory, as something more than a rough assay was desired, I concluded to try some of the various methods published and compare the results obtained.

The method which I have been using for some time past and which leaves little to be desired is essentially that published in the *Ephemeris*, by Dr. Squibb, whose kind permission I have to describe it briefly, with a few comments which may not be amiss.

I have compared this method with the official one of the Pharmacopœia and also with others, upon a specially prepared sample of opium made up from selected specimens which were dried, powdered and thoroughly mixed. In four different parts of this sample the morphine was determined by Dr. Squibb's method and the average of the results obtained was taken as the percentage of morphine.

The following is a brief description of this method of assay, as used in my own practice. It consists of three distinct operations, viz.: 1st. The preparation of the extract. 2d. Separating the morphine therefrom; and 3d. The treatment of the separated alkaloid.

1st. A convenient weight of the sample (preferably about 10 grams) is introduced into an ordinary salt mouth vial of about 4 to 6 ounces capacity, fitted with a good cork. About 100 cc. of *boiling* water is added, and the bottle is tightly corked and allowed to stand, after frequent hard shaking, for from twelve to twenty-four hours. The magma is allowed to settle, and the dark extract is decanted upon a filter of convenient size. When most of this extract has run through into a medium size beaker, from 30 to 50 cc. of boiling water is added, the bottle is well agitated, and the contents are then transferred to the filter with as little hot water as possible. When all the liquid has drained through the filter it is carefully washed down with a very little hot water, applied drop by drop around the edges, and allowed to drain as much as it will. As soon as the liquid ceases to drop, the beaker is replaced by an evaporating dish of about 100 to 150 cc. capacity, and the contents of the filter are brought back into the bottle by means of a small spatula, and again shaken up with about 50 cc. of hot water. They are then thrown upon the same filter and are washed completely upon the filter from the bottle, this washing being continued until about 100 cc. have run through into the dish, or until the washings come through colorless. The dish is now placed upon a water-bath and the weak extract evaporated, adding to it from time to time the stronger portion from the beaker, until the whole is concentrated to a volume

of about 20 to 25 cc. The concentrated extract is transferred with as little water as possible, to a 2 ounce Erlenmyer flask, accurately tared and provided with a tight-fitting cork, and allowed to cool. It is now ready to be submitted to the second part of the process, viz., the separation of the morphine.

2d. After adding 10 cc. of 95 per cent. alcohol, the flask is agitated, and a volume of ether equal to that of the contents is added, the cork is tightly fitted and the flask well shaken. The cork is now removed, and, before the ether has had time to separate, a slight excess (about 4 cc.) of a 10 per cent. solution of ammonia is added. The cork is again replaced and the flask well shaken until crystals of morphine begin to separate. The flask is now set aside in a cool place and the separation of the alkaloid allowed to continue for about twelve hours, when it will be complete. This complete separation may also be accomplished in from half an hour to two or three hours by continuous or frequent agitation.

The alcohol is added in order to permit of the ether mixing readily with the aqueous extract, and thereby prevent the separation of narcotine which is readily soluble in this menstruum.

3d. When the separation of morphine is complete the cork is removed from the flask and the upper stratum of ethereal fluid carrying most of the narcotine, etc., is carefully decanted through a tared filter of 9 centimeters diameter, without disturbing the dark, watery liquid in the bottom of the flask. Upon this dark liquid is now poured about 20 cc. more ether, which is rinsed around the sides of the flask and the surface of the liquid, and is decanted carefully through the filter as before, that remaining being absorbed by means of a strip of blotting paper. The filter is washed down with a little more ether, applied drop by drop around the edges and allowed to dry so that the heavy liquid which is now thrown upon it, together with the morphine, will pass through readily. The crystals remaining in the flask are then washed upon the filter with cold water and the washing continued until the water comes through colorless.

The filter and contents are removed from the funnel, and the edges, having been carefully folded together, are pressed between folds of blotting paper until most of the moisture is absorbed. It is then dried in an air-bath (together with the tared flask, if any of the crystals remain adhering to its sides) at a temperature of 100° C., and weighed, the result obtained, after subtracting the tare of the filter (and flask, if

it has been found necessary to dry and weigh it), will be the weight of morphine in the sample taken.

Dr. Squibb directs that 1 gram of these crystals, finely powdered, should be weighed off and treated in a large test tube fitted with a cork, with 10 cc. of official lime water; upon occasional shaking, the whole should dissolve, thereby showing the absence of narcotine.

He also says that the filter should be tared both before and after weighing the crystals. This, I think, hardly necessary, as the coloring matter and gumming substances can be washed quite free from the paper and crystals without danger of loss of morphine if the water used is quite cold. I have tried this repeatedly, and find that 50 cc. of water used in washing will not make any great difference in the weight of the morphine.

It is also my experience that the use of *hot* water in making the extract seems to work much better than cold; the final results of the assay, if carefully conducted, being about the same in either case, but the opium can be completely extracted with much less water in the former case, the resulting liquid filters much more readily, and the magma is much easier to wash.

I hope to continue this subject in a future paper, describing some results with other methods upon the sample already referred to.—
Jour. Am. Chem. Soc., February, 1885, p. 45-57.

DETECTION OF STRYCHNINE AND OTHER ALKALOIDS IN CASES OF POISONING.

BY T. CHANDELON.

The usual mode of isolating strychnine in poison cases is that of Stas: the following process is recommended as more convenient and very accurate. The intestines, etc., are cut up very finely, mixed with an equal weight of well-burned gypsum, and the whole well rubbed in a mortar until a perfectly homogeneous mass results. This sets in 4 to 5 hours, when it is easily broken up into fragments. These are dried either in a water- or air-bath at 70°, pulverized, and the powder boiled with 90 per cent. alcohol to which some tartaric acid is added. When the powder has been boiled for an hour in a large flask connected with a reflux condenser, it is filtered, and the residue washed with hot alcohol. If the reaction of the filtrate is not acid enough,

tartaric acid is added and the whole distilled. When the bulk of the alcohol is distilled off, the remainder is expelled by evaporation to dryness on the water-bath, the residue is taken up with a little boiling water, and left to cool in order to separate the fat. The filtrate, which should be about 20 to 25 cc., is made decidedly alkaline with soda and transferred to a large watch-glass, mixed with gypsum, allowed to set, powdered, dried in an exsiccator, and then extracted with chloroform in a large Soxhlet's apparatus. The chloroform extract is brought to a small volume, 10 to 15 cc., filtered if necessary, and the extract treated with an equal volume of a saturated solution of oxalic acid in ether. Fine acicular crystals of strychnine oxalate soon appear; the oxalate is collected on a filter, washed with a mixture of equal parts of alcohol and chloroform, dried and dissolved in the least possible quantity of water, and the strychnine precipitated by addition of ammonia.

By this method, the author has recovered strychnine from a frog killed by a subcutaneous injection of 0.01 gram, from the liver of a rabbit killed by subcutaneous injection of 0.04 gram of the sulphate, and from the stomach of a cat killed by eating flesh containing 0.03 gram of strychnine.

Experiments show the process to be very accurate. As chloroform is a solvent of most vegetable alkaloids, it is evident that this process or a slight modification of it can be used for the isolation of such of them as are precipitated by an ethereal solution of oxalic acid. The author made experiments with brucine, narceine, papaverine, thebaine, morphine, aconitine, atropine, hyoscyamine, veratrine, nicotine, conine, and colchicine, two of these, morphine and colchicine, were not soluble in chloroform, the others were completely precipitated as oxalates. The precipitate took some hours to form in the case of strychnine, brucine, narceine, codeine, nicotine, and conine, for the remainder 24 hours were necessary. The precipitate was crystalline in every case except that of aconitine, which was amorphous.

In the case of brucine, nicotine, veratrine, and atropine, which are not completely precipitated by ammonia, the oxalate is dissolved in alcohol, the oxalic acid is precipitated by a little alcoholic potash, filtered off, and the potash removed by a stream of carbonic anhydride; after frequent filtration, the alcohol is allowed to evaporate spontaneously, and the pure alkaloid remains.—*Jour. Chem. Soc.*, May, 1885, p. 605; from *Zeit. Physiol. Chem.*, [9], 40–48.

PREPARATION OF NITROUS OXIDE.

BY P. CAZENEUVE.

The explosions which sometimes take place in the preparation of this gas on the large scale, are explained by the fact that the decomposition of ammonium nitrate is an exothermic reaction, and that the large quantity of heat thus liberated added to that directly applied, is capable of causing the sudden decomposition of the whole mass of the salt. The process is often slow in beginning on account of the contained moisture, and hence the operator is apt to apply undue heat at first. Therefore, the salt should previously be dried in a capsule at a temperature below 200° , and the retort should be heated slowly until the disengagement of gas begins, when only a very gentle heat will be required, and the operation should not be pushed too far towards the end. That the recently prepared gas has an irritating odor and causes symptoms of asphyxia, whilst after standing for some days in the gas-holder it becomes easier to breathe, is due to the well-known difficulty of completely removing small quantities of one absorbable gas from another, even when the absorbing solution is very energetic in its action. The author found that nitrous oxide even after slow passage through solutions of ferrous sulphate and of sodium hydrate, retained this irritating odor, which he traced to the presence of a little hyponitrous acid. But when the gas was several times shaken up in a test-tube with a solution of ferrous sulphate, the irritating odor was at once removed, and the same effect was produced by allowing it to remain 24 hours in the gasholder. The author recommends that the gas should in all cases be prepared a sufficient time beforehand. The diminution in the anæsthetic properties of the gas after remaining for a time in the gasholder, is due to the fact that the nitrous oxide always contains a little free oxygen and free nitrogen, and that during a prolonged stay in the gasholder, the water gradually absorbs the protoxide; the relative proportions of oxygen and of nitrogen are thereby so increased that the anæsthetic property of the gas is sensibly diminished.

The author has examined the liquefied nitrogen protoxide, prepared in Paris by Duflos, and in London by Barth, and sold in cast-iron bottles. He finds these products are chemically pure, and therefore their employment in dental practice offers great advantages.—*Jour. Chem. Soc.*, May, 1885, p. 613; from *J. Pharm.*, [5], XI, 67-73.

DETECTION OF NITROUS AND NITRIC ACIDS.

BY R. WARINGTON.

In the present communication the author gives the results of experiments on the various tests for nitrous and nitric acid. The delicacy of a test depends greatly on the manner in which it is applied, therefore old as well as new tests are included in the present note. In nearly all cases blank experiments were made under exactly similar conditions to those of the test experiment.

Detection of Nitrous Acid. Iodide Test.—1 cc. of Trommsdorff's reagent is added to 5 cc. of nitrite solution, and the mixture acidulated with one drop of dilute sulphuric acid (1 in 5); under these conditions a solution containing 1 part of nitrous nitrogen per million of water soon caused an abundant liberation of iodine, whilst 1 in 20 millions gave rise to a blue coloration in 3 minutes, and solutions containing 1 in 100, and 1 in 200 millions, gave a blue tinge in 30 and 60 minutes respectively. The blank experiment only began to color in 4 hours. The *metaphenylenediamine test* is accelerated by warming. Four drops of a solution containing 5 grams per litre, and one drop of dilute sulphuric acid added to 5 cc. of nitrite solution, causes a speedy and very distinct reaction with one part of nitrous nitrogen per million of water, but with 1 in 10 millions the change begins in 2 minutes, and the final color is only pale straw-yellow. *Paramidobenzene-azo-diamethylaniline test* (Meldona, Trans., 1884, 108).—A solution containing 0.16 gram of this reagent per litre is employed, and one drop of test solution, one drop of dilute sulphuric acid, and finally a slight excess of ammonia, are added to 5 cc. of nitrite solution. No reaction is obtained with solutions containing 1 part nitrous nitrogen per million of water, when the reagents are added immediately after one another, but when the solution acidified with sulphuric acid is heated for 2 minutes in boiling water, then on addition of the ammonia a distinct blue coloration is obtained even with 1 part of nitrous nitrogen in 10 millions of water, and a pale sap-green with 1 in 100 millions. The color is somewhat fugitive. With the *naphthylamine test*, using one drop of saturated solution of sulphanilic acid, one drop of dilute hydrochloric acid, and one drop of saturated solution of naphthylamine hydrochloride, as already stated (Trans., 1881, 229), 1 part of nitrous nitrogen in 100 millions

gives a reaction in six minutes, 1 in 500 millions in an hour or two, whilst even 1 in 1,000 million can be detected.

Detection of Nitrous and Nitric Acids.—The four following tests give a reaction with both nitrous and nitric acid, but the reaction of the first mentioned is the only one which is characteristic for these substances, inasmuch as the other three give the same reaction with all oxidizing agents. The *ferrous sulphate test* is equally sensitive with both nitrous and nitric nitrogen, and is conducted most effectually in the following manner. Place 1 cc. of nitrite or nitrate solution into a tube, and pour down 2 cc. of concentrated sulphuric acid so as to form a lower layer, mix suddenly and run in immediately 3 cc. of a cold saturated ferrous sulphate solution, which forms an upper layer. In this way, with solutions containing 1 part of nitrous or nitric nitrogen in 100,000 parts of water, the colored band appears at once, with 1 in 200,000 there is a faint reaction in 1 or 2 minutes, whilst with 1 in 300,000 the reaction is very slight. *Indigo test* (according to Bous-singault).—The concentrated substance is boiled with a few drops of indigo, and successive quantities of strong pure hydrochloric acid, the disappearance or discoloring of the indigo is the indication of oxidation. One division of Boussingault's weakest indigo = 0.00077 milligram of nitric nitrogen. This test does not answer in the presence of many organic substances. *Brucine test.*—To get a distinct pink color, 5 cc. of concentrated sulphuric acid are added gradually to a cooled mixture of 2 cc. of the liquid and one drop of brucine sulphate. One part of nitric nitrogen in 10 millions of water soon gives a reaction, whilst 1 in 20 millions causes a faint tinge after some time. With nitrous nitrogen, 1 part in 1 million of water gives a full pink, but 1 in 10 millions produces scarcely any reaction. *Diphenylamine test.*—The reaction is assisted by heat, by adding a large excess of sulphuric acid, also by the presence of chlorides, but only when the volume of sulphuric acid is not greater than that of the liquid taken. The color is fairly permanent, and increases on standing. With 2 cc. of liquid, two drops of diphenylamine solution and 5 cc. concentrated sulphuric acid, 1 part of nitric nitrogen in 1 million of water produces a deep blue at once, 1 in 10 millions a pale blue after a few minutes, whilst 1 in 20 millions gives no distinct blue. (Trans., 1884, 644, it is stated that solutions of this strength do give reaction; it has, however, since been observed that the reactions obtained in those experiments were due to an added impurity.) Nitrites act in a similar manner, but more

rapidly. One millionth part of a gram of nitric nitrogen can be detected by this test when using 1 cc. of liquid.

Detection of Nitric Acid in the Presence of Nitrous Acid.—There is no satisfactory method for effecting this when the quantity of nitric acid is very small, for nitric acid is either produced, as in the second and third, or only vaguely indicated, as in the first of the following methods. 1st. Estimate the total nitrous and nitric nitrogen as ammonia or nitric oxide; and then the nitrous nitrogen with permanganate, or with phenylenediamine, the difference between the two estimations, is due to nitric nitrogen. 2d. Piccini recommends destroying nitrites by boiling acidified solutions with carbamide, and then testing for nitric acid. 3d. Muir suggests conversion into ammonium salts, and evaporating to dryness to destroy nitrite.—*Jour. Chem. Soc.*, May, 1885, p. 593; from *Chem. News*, [51], 39–41.

ON THE EXAMINATION OF BUTTER.

BY MORTON LIEBSCHÜTZ.

Although it does not seem a matter of much importance, in the abstract, whether the fatty body used as food is derived from the fatty deposits of the animal, or from the emulsion called milk, the chemist is often compelled to decide whether a given sample is genuine butter or an imitation.

Dalican has given a method based on the percentage of *insoluble* fatty acids. He asserts that, as a nearly general rule, pure butter yields 86.5 per cent. of fatty acids, while oleomargarine shows only 93.75 per cent. His method, which is excellent when time permits, and only a few samples are to be tested, is too tedious for general use. The washing of the fatty acids of pure butter requires at least two days, it being considered complete only when the water used for the operation remains perfectly neutral.

The determination of the glycerin would be, I think, a shorter way of examination, and David's method of saponification by barium hydrate might be used with advantage. David proposed the method for the so-called titration of tallow, his plan being to extract the glycerin from a large sample of fat (100 grams), to bring the glycerin to a known volume, and to take its specific gravity. Knowing the per-

centage of glycerin contained in solutions of determined specific gravity, he calculated the yield in glycerin from the fat treated. This method has not, so far as the author is aware, been adopted, and it is doubtful if it will be. First of all, the glycerin obtained is impure, containing compound salts of glycerin and baryta. For this reason the results are liable to vary with the different fatty bodies; the glycerin of each different fat will contain proportions of saline matters different from the glycerin yielded by the fat taken as a type, the solutions of which have been regarded as containing the standard amount of glycerin. Although we know that the *volumetric* determination of glycerin, or more properly the hydrometric determination, cannot be used, the process of saponification may be applied with advantage to the examination of butter. We shall describe the method as it might be used for butter analysis. David's paper will be found in "Comptes Rendus," 1882.

The sample of butter, so called, is first melted in the air-bath at 70°C. The clear fat rising above the water, salt and other impurities, is decanted through a small dry filter, placed in a warm funnel, and the filtrate is collected in a small dish. About 20 grams are taken, allowed to cool, and weighed, together with a small spatula. 10 grams are removed and placed in a porcelain capsule of about 500 cc., heated on a steam or water bath, and when the fat is very warm 20 grams of barium hydrate (9 mols. water) are added. When the emulsion has formed, pour in 30 cc. of hot alcohol, at 90°C., stirring briskly until the mass is nearly dry.

Add 200 cc. of cold water; break the mass of barium soap with the spatula, and boil to reduce the liquid to one-half. Cool for a time, decant through a linen filter, repeating the boiling and the decantation three times at least; then, finally, throw the whole contents of the capsule upon the filter, after dividing the soap finely with a small pestle. Wash the filter with a few cc. of water, and squeeze it with the fingers. Evaporate all of the solutions to about 100 cc.; add litmus and neutralize cautiously with dilute sulphuric acid. Neutralize the slight excess of acid with barium carbonate. Filter the solution, wash the filter, and evaporate the liquor to a syrupy consistency.

As has already been said, the glycerin so obtained is not pure. Treat the contents of the capsule with strong alcohol; a large quantity of salts is thrown down. The alcoholic solution is filtered through a small filter, previously moistened with alcohol, and the filtrate is col-

lected in a tared platinum or porcelain dish. Evaporate the alcohol on the water-bath and dry in the air-bath above 100°C. to constant weight. After noting this, heat the glycerin, and burn it. The weight of the ash is deducted from the total weight; the difference is glycerin. The percentage of ash compared with the total percentage of glycerin is by itself an important factor, as glycerin derived by this mode of treatment from pure butter gives 5 per cent. of ash, whereas the glycerin of oleomargarine and other similar fats leaves only from 0.3 to 0.6 per cent.

By this method I have found, after deduction of said ash, 3.75 per cent. glycerin in pure butter; 7 per cent. glycerin in oleomargarine.—*Jour. Amer. Chem. Soc.*, May, 1885, p. 135.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Trehala which is used as food in Syria, has been investigated by Guibourt (1858), Berthelot and Hanbury. It is a cocoon formed upon a species of *Echinops* by a beetle which has been named *Larinus nidificans*, *Guibourt*, *L. subrugosus*, *Chevrolat*, and *L. maculatus*, *Faldermann*. The same substance has now been further examined by Dr. G. Apping (Thesis, Dorpat, 1885). His chemical analysis yielded moisture 10.78, ash 2.79, fat and chlorophyll 0.16, trehalose 23.84, tannin and citric acid traces; albuminoids soluble in water 8.09, soluble in soda 1.88, and insoluble in both liquids 2.31; cellulose like substance derived from starch 24.90; true starch 6.72; mucilage soluble in water 7.60, and mucilage insoluble in water 10.93. The most important constituents, trehalose, starch and mucilage, were fully examined, and inquiries were made into the origin of trehala. The cocoon is a product of the larva, but the material for this structure, although of vegetable origin, cannot have been derived from the plant, upon which it was built, since Apping found the pith and other portions of the tissue of the stems to be entirely free from starch and from trehalose, while the granules detected in portions gnawed by the larva were observed to be outside of the cell walls; these microscopic observations were verified by Professor Russow.

Maize and oil of maize. Maize or Indian corn is a valuable article of food, containing about 10 per cent. of nitrogenous principles and 7 per cent., or in some varieties 9.5 per cent. of fat. The presence of

the latter interferes with many of the uses for which corn is otherwise adapted, but the ripe fruit cannot be deprived of the oil by pressure. After the grain has been malted, the light germ may be separated by careful crushing and winnowing, and yields by pressure about 15 per cent. of oil, and a press cake, rich in albuminoids and retaining 4 or 5 per cent. of oil. In the manufacture of starch the ground mixture of corn and water, on standing, deposits the starch and leaves a milky liquid, which readily undergoes putrefaction. This liquid is an emulsion of oil of maize in the dissolved albuminoids, and may be utilized for the production of both substances. The separation may be accomplished according to a patent granted March 10, 1885, to Dr. F. V. Greene, by precipitation by heat or by diluted mineral acids or various salts, notably by aluminum sulphate. According to the manipulation the oil may be recovered by filtration, by pressure or by a solvent, the remaining albuminoids being valuable for manure or for other purposes.

Oil of maize has been used to some extent as a lubricator and for soap-making. It is of a yellowish or bright yellow color, bland, rather thick, has the specific gravity 0.92 and at -10° C. (14° F.) congeals to a white mass. The oil is colored transiently dark green by sulphuric acid, and orange red by nitric acid, and by nitrous acid it is converted into a somewhat soft yellow mass.

Aloin. Dr. Justus Dietrich (Thesis, Dorpat, 1885) has studied the detection of aloin in animal secretions and excretions, and found the following reactions serviceable for this purpose:

$\text{HNO}_3 + \text{KCyanide}$.—The residue left on evaporating the alcoholic solution was dissolved in a few drops of nitric acid, the solution evaporated by means of a steam bath, dissolved in alcohol, and the deep red solution treated with a drop of alcoholic solution of potassium cyanide, which produced a rose-color with five different aloins.

In the following tests the aloin residues were dissolved in a little water:

Chloride of gold produced with barbaloin a raspberry red color (still recognizable with 0.00006 aloin) after some time changing to violet. Socaloin and cape-aloin gave a rather faint color, rapidly changing to violet; nataloin red-violet, rapidly turning to violet; Curaçao-aloin bright red.

Bromated potassium bromide gave a distinct turbidity with the aloins of Barbadoes, Socotra and Curaçao; none with Port Natal or Cape-aloin.

Tannin gave a turbidity only with barbaloin, probably due to a decomposition product.

For the detection of aloin the fæces were digested with water acidulated with sulphuric acid, then macerated for 12 hours with three volumes of strong alcohol, the filtrate concentrated, and the residue successively agitated with petroleum benzin and amylie alcohol; on evaporating the latter aloin was left. The treatment of blood and urine was similar. From his results the author concludes that on taking aloes or aloin, the greater portion is excreted with the fæces; a small portion only is absorbed and passes mostly through the kidneys while the remainder enters the liver and with the bile is conveyed back into the intestines.

Products of Xanthorrhœa. Baron Ferd. von Mueller (*Zeitschr. Oesterr. Apoth. Ver.* 1885, 293) gives an account of the geographical distribution in Australia and Tasmania of the different species of this genus and of their resinous products, which of late years have been extensively exported by Messrs. William Somerville and Henry Wilks who prefer the resin of *X. hastilis*, *X. quadrangulata* and *X. Tateana* for various reasons; *X. Preissii* yields one of the best resins, and is widely distributed in Western Australia. The resin of *X. hastilis* is known as gum acroides, is yellow and lighter colored than the other kinds, usually more sticky, and less inclined to become pulverulent; it is rather fragrant, but less so than the resin of *X. quadrangulata*. A comestible gum somewhat resembling tragacanth is sometimes deposited in the trunk in vertical concentric layers. 300 tons of the resins of *X. hastilis* have been exported in one year, and at one time the price rose to £65 per ton for the best quality, but for ordinary quality is from £7-10. One trunk yields on an average 5 pounds of resin which exudes from the persistent rudiments of the leaf bases, the exudation being sometimes increased by bush fires.

The resin of *X. Tateana* is dark reddish-brown, like the resin of *X. australis*, but dryer; a trunk yields about 20 pounds, and during the collection of the resin is destroyed; the value is about £25 per ton.

The author has sometimes seen masses of resin weighing 50 pounds at the base of the trunk of *X. australis*, most probably the produce of several years melted together by repeated fires. *X. semiplana* is stemless and produces little resin. *X. minor* is matted, the tufts of leaves being approximate and radical. In wet soil *X. Preissii* remains stemless.

The resin of *X. quadrangulata* is dark, glossy and of an agreeable odor resembling that of honey and benzoin; on exposure it becomes somewhat powdery, but is also found as small globular masses at the base of the trunk. *X. arborea* has the persistent bases of the leaves of previous years very short, and the resin is rather difficult to collect; the yield of trunk is about 3 pounds, and the resin is almost ruby colored.

NATURAL CAMPHOR OILS.

BY PETER MACEWAN,

Secretary in Scotland to the Pharmaceutical Society.

Natural camphor oils, namely, those of *Dryobalanops aromatica* and *Camphora officinarum*, have long been esteemed as remedial agents in the countries where they are produced, and their introduction in this country is considered by some a mere question of time.

The *Dryobalanops*, or Bornean camphor oil, is a more simple body than laurel camphor oil, consisting chiefly of borneène, an isomer of turpentine oil, with a small quantity of resinous matter. Its specific gravity is close upon 0.900. Johore oil, which I have previously referred to, has a specific gravity of 0.882. Other samples (for which I am indebted to Mr. Jackson, Curator of the Kew Museum) are somewhat higher, one (*a*) being 0.894, and another (*b*) 0.909: *a* is De Vriese's specimen and *b* Mr. Motley's; both are over thirty years old. Specific gravity is the point in which the Bornean oil differs chiefly from laurel camphor oil, the former being much lighter. The Bornean oil in its natural condition, and even when old, does not contain its peculiar camphor in solution; hence it undergoes no change when exposed to a low temperature, which is another point of difference between it and the laurel camphor oil; so, also, is it different from the fact that it acquires a green color, similar to cajuput oil, when kept in contact with metallic copper for a day or two.¹

The Bornean oil does not appear to enter the British drug market, unless (probably) as an adulterant of cajuput oil.

The camphor oil of Formosa was the only lauraceous kind with

¹ The intensity of the color varies; it was least with Johore oil and greatest with Mr. Motley's. Laurel camphor oil becomes brown or greenish-brown.

which we in this country were familiar until lately. Mr. Holmes has favored me with a portion of specimen (451 c, Catalogue of the Pharmaceutical Society's Museum) which came from Formosa, per ship *Nestor*. This has a specific gravity of 0.943, and becomes gelatinous, from separation of camphor, when frozen. The color of this oil is golden yellow. If a drop of it be rubbed on the back of the hand a strong camphor odor is first felt, and when the camphor dissipates, a sassafras odor remains. The oil quickly dries upon the skin and leaves no mark. This oil may be taken as a saturated oleaceous solution of camphor. No satisfactory chemical examination of it has yet been made, the results of earlier chemists, such as Martius and Pelouze, being somewhat conflicting and indefinite.

Japanese camphor oil appears to have been brought to this country only recently. A specimen was presented to the Pharmaceutical Society towards the end of last year. Mr. Braithwaite, in a paper communicated to the London Chemists' Assistants' Association, says of it: "It is the essential oil obtained as a bye-product in preparation of camphor from *Laurus camphora* (sic). It consists of a saturated solution of camphor in one or more hydrocarbons of the terpene group. . . . The odor is peculiar, resembling a mixture of camphor and sassafras. It is remarkable that the crude oil from Japan smells much more strongly of this oil than that from Formosa."¹

The specific gravity of this oil is 0.951, somewhat greater, therefore, than that of the Formosa oil, yet it is a thinner oil. The color is similar. The odor of camphor is feeble, indeed, if one could disassociate from it the idea of camphor, I question if it could be perceived; but the sassafras odor is very powerful. The feeble camphor odor is explained in what follows, and is due to the absence of camphor, for there is no separation of camphor when the oil is chilled, as we would expect were it, like the Formosa oil, a saturated solution of camphor or crude oil, as Mr. Braithwaite states. The specific gravity of the oil is almost the same as that of crude oil, yet when camphor is removed from crude oil it becomes lighter. In the "Chemical News" for December 12, 1884, there is an interesting paper by Mr. H. Oishi, which throws some light on the apparent anomaly. This paper contains an account of the method followed in Japan for the sublimation of camphor from the wood, and also that for the separation of camphor from the crude oil, which was devised three years ago. Briefly stated,

¹ "Chemist and Druggist," 1885, p. 20.

the method is simply distillation, the distillate being collected and surrounded with cold water. "Camphor separates out as a semi-solid mass, and, in order to separate the solid camphor from the oil, the liquid is filtered or squeezed out through a cloth bag." By a second distillation more camphor is obtained.

Assuming (owing to high specific gravity) the specimen under notice to be crude oil and that chilling without previous distillation does not effect separation of camphor, I roughly distilled a small quantity so as to simulate the Japanese method. Very little came over below 150° C., about a twelfth between that and 170°, a fifth between 175° and 185°, and nearly the same up to 205°. None of these yielded camphor when chilled. So far, distillation had gone on for an hour, and yet there was not a crystal of camphor about the condenser, nor did the residue yield any when chilled. The experiment conclusively proves the absence of camphor.

According to Mr. Oishi, the purified oil has a specific gravity of 0.895, the crude 0.959. My specimen is 0.951, yet it is the purified article. Mr. Oishi's experiments explain this. His results show that the purified oil is composed to the extent of nearly three-fourths of bodies boiling above 170° C., and these are heavier than the more volatile bodies, the heaviest being 0.926. The oil which I have examined gives little or no distillate below 140° C., some between that and 150° C., and nearly one half of the whole requires a temperature up to 205° to vaporize it, and the residue has a specific gravity of 0.995. The inference is apparent.

So, therefore, the camphor oil of Japan has the camphor removed from it before it is sent to this country, and in this condition it is (according to Mr. Oishi) "a complicated mixture consisting of hydrocarbons of the terpene series, oxyhydrocarbon isomeric with camphor, and other oxidized hydrocarbons." The camphor isomer distilled between 180° and 185° C., and constituted from 10 to 12 per cent. of the whole. It is a liquid.

I find that the Japanese oil differs from the Formosa oil in its behavior towards nitric acid. If half a drachm of B.P. acid be allowed to act upon a few drops of the Japanese oil for a minute, then diluted with half a drachm of water, a crimson color is imparted to the clear watery solution; but the Formosa oil so treated gives a milky solution having a scarcely perceptible green shade. Hydrochloric acid acquires a salmon color with both; more marked, however, with Japanese oil.

The camphor-free oil is used in Japan chiefly as an illuminant by the lower classes, also for the preparation of carbon for "Chinese Ink," and Mr. Oishi indicates a use for it as a constituent of varnishes.¹ It is questionable, however, if it can be called an efficient substitute for the popular camphorated oil of this country, and I cannot conceive how it is destined to replace it. The crude oil might possibly be a valuable addition to our materia medica, but I am afraid that its sassafras odor would prevent the public taking it up.

From the United States we hear that large quantities of this oil are being received there, and that it is being used for adulterating oil of wintergreen. There should be no difficulty in detecting the adulteration, for oil of wintergreen has a specific gravity of 1.180, which the addition of camphor oil will lower. A rough and ready test (perhaps as good as any) is to gently agitate a few drops of the oil in water; if it be pure it wholly subsides in a few seconds, but if it contains camphor oil several minutes elapse before it subsides, and time is given to notice that the particles of oil assume different forms other than globular.

The action of nitric acid may also be noted; it has little effect upon pure oil, but adulterated oil becomes red.—*Phar. Jour. and Trans.*, June 20, p. 1045.

The Tests for Bile in Urine have been critically examined by Carl Deubner (Thesis, Dorpat, 1884), who obtained the best results with the methods proposed by Hilger and by Rosenbach. According to Hilger ("Archiv d. Phar., vol. 206, p. 385) the urine is moderately heated and rendered alkaline by barium hydrate; a small portion of the washed precipitate treated carefully with a few drops of concentrated nitric acid gives the well-known color reactions, green, violet, blue.

Rosenbach ("Chem. Centralblatt," 1876, p. 150) recommends filtering the urine through white filter paper; this acquires a yellow or brown color, which with a drop of nitric acid changes to yellowish red, the margin of the spot becoming violet and deep blue, while towards the centre the color gradually changes to emerald green. The modification of this test recommended by Deubner consists in placing a few drops of the urine upon a porous plate of white clay, when the spot remaining will show the reaction plainly and for some time. The advantage of this modification is that very little of the material is sufficient for applying the test, and that errors arising from the decomposition of the paper by the acid are excluded.

¹ When the oil is rubbed on the skin a resinous coating remains on drying. This is rather objectionable than otherwise.

BAROS CAMPHOR—"KAPUR BAROOS" OF JOHORE.

BY PETER MACEWAN.

This camphor is "found native," and since an early date has been sought after by the inhabitants of the Malayan Archipelago. Though not surprising to learn that it is obtained in Johore, the Forestry Exhibition specimens appear to be the first brought to this country. I have failed to find any information in books regarding the extent to which *Dryobalanops aromatica* exists in Johore, and the amount of camphor obtained therefrom. Mr. Jamie says :

It is only within the past few years that Johore was known to contain camphor trees, similar to those in Borneo, growing amongst many other valuable kinds of timber. As it may not be generally known, I may mention that in the protected State of Perak a vast forest of camphor trees has been found and this is conserved by the Government."

Mr. Meldrum writes: "The Kayo Kapur yields the gum known as Borneo camphor or 'Kapur baroos.' It is the natural production of the tree and from its scarcity and the virtues attributed to it by the Chinese, *fetches more than its weight in silver. It all goes to China.* The timber of the camphor tree is as durable and as strong as teak. It weighs 48 lbs. per cubic foot. It is a handsome tree, frequently running up to 150 feet with a diameter of 6 or 7 feet at 5 feet from the ground."

Two very interesting papers on "Borneo Camphor" are contained in the twelfth volume of the "Pharmaceutical Journal," one by Dr. W. H. de Vriesse, the other by Sir W. J. Hooker. In these and the classic account given by the authors of "Pharmacographia," full information regarding the method of collection will be found. The amount annually obtained varies considerably. Thus the Labuan export in 1863 was valued at 5,168 dollars; in 1864, 11,156 dollars; and in 1881 it had fallen to 2,587 dollars. There is a duty of from 5 to 10 per cent. on this as on all natural products.

The Maharajah's collection contained four qualities of the camphor, a specimen of the oil, and a good section of the tree showing the camphor *in situ*. Of the latter, Professor Archer was exceedingly proud. In Hooker's paper, the illustration given of a specimen received from Labuan represents a condition of things quite different from the Johore specimen. In the former, the crystals (which are of the rectangular prism form) are situated in and around furrows in the wood, but in the latter the wood is only roughened, not furrowed, and the camphor is deposited in scales. Where the cleft occurs in the wood the surface is of a brown color, and has a varnished appearance (due to deposit of resin), the crystals adhering to it. Otherwise, the wood is exactly the color of cinnamon.

I have said that the camphor is in four qualities. This is noteworthy, for in "Pharmacographia" it is stated that it is picked, cleaned and selected into *three qualities*; Mr. Jamie also states in the subjoined note, that it is unusual to find four qualities. For these reasons, I give details.

First quality.—Transparent crystals, unmixed with woody matter and destitute of color. Few of the crystals are less than a sixth of an inch

across; generally a quarter of an inch and upwards. Three picked crystals gave the following measurements and weights: 1. 16.25×11.5 mm. and 25 centigrams; 2. 15×12 mm. and 36 centigrams; 3. 13×10.25 mm. and 27 centigrams.

Second quality.—Crystals inferior in size to the above, and they are mostly of a brown color. There is a considerable proportion of small crystals approaching the pulverulent condition. Two picked crystals gave the following measurements and weights: 1. 12×10 mm. and 16 centigrams; 2. 9×5 mm. and 8 centigrams. In addition to brown coloring matter there is free woody tissue, etc., the residue obtained after washing with rectified spirit amounting to 2.8 per cent.

Third quality.—This is made up of powdery crystals, coherent and slightly colored greyish. It contains very little insoluble matter, the residue obtained from 2 grams being unweighable. In appearance it resembles crude Japanese camphor. May this specimen be the result of sublimation!

Fourth quality.—Brownish and pulverulent; not unlike seashore sand. Not so coherent as the third quality. It contains 2.3 per cent. of insoluble matter.

I asked Mr. Jamie if he had ever met with four qualities in Singapore, and gave him a description of these, to which he replies: "The four qualities of camphor you allude to, unless specially marked as coming from Borneo, are surely the product of the Johore camphor tree. How there can be *four qualities* from the one tree is more than I can satisfactorily explain. Both natives and Chinese pick out the large and clear crystals from the smaller and colored ones in order to obtain a better price. As this camphor is highly esteemed by the Chinese and natives, the practice of picking would be resorted to, as well as that of adulterating with Japanese and Chinese (Formosa) camphor, which is readily procured in the native bazaars. [The appearance of the third quality as suggesting admixture with laurel camphor is here alluded to.—P. M.] It is very well known that few classes of people are such adepts at adulterating as the Chinese are, and this may account for the similarity of appearance. The Bornean camphor is all in the hands of the Chinese and native traders, and the Johore camphor will be also. The stock of either kind is very limited, and commands absurdly high prices. In Borneo I paid 5 dollars per ounce for a genuine specimen of the camphor, which I presented to the Museum of the North British Branch of the Pharmaceutical Society. Compare it with the Johore samples."

Mr. Jamie's specimen is like what a mixture of the four Johore qualities would be. It contains some very fine crystals, free from color, but also colored and powdery crystals. Another sample sent home by Mr. Jamie consists of a mixture of crystals and wood.

In "Pharmacographia" it is stated that Borneo camphor does not crystallize on the interior of the bottle in which it is kept. This is not correct. The bottle containing Mr. Jamie's genuine sample has a well marked deposit, and in the bottles containing the Johore specimens deposits have commenced, particularly in the third quality. I observe a *very large deposit* in an old specimen in the Edinburgh Museum of Science and Art.

This specimen is kept in the top gallery, where the temperature is frequently high.

There is nothing remarkable about the camphor oil, it is similar in appearance to laurel camphor oil which has lately been introduced here. Its specific gravity is 0.882. Mr. Jamie says of it, "Every camphor tree yields a large quantity of oil which is very much used externally for rheumatism by all classes, *and is often used as an adulterant of cajeput oil*, being considerably cheaper than it. The camphor oil might be used instead of the Pharmacopœia lin. camphoræ. I have seen it frequently prescribed in place of it.

I beg to express my indebtedness and thanks to Mr. Jamie for his valuable information. — *Phar. Jour. and Trans.*, March 28, 1885, pp. 795-796.

NOTE.—In a note to "Phar. Jour. and Trans.," May 2, 1885, Mr. J. R. Jackson states that two samples of Baros camphor in the Kew Museum corresponding to the third quality, as classified by Mr. MacEwan, have deposited crystals; one of these samples was sent from Borneo by the late Mr. Motley in 1851, the other from Sumatra by Dr. de Vriesse in 1855. The superior kinds, whiter and larger crystals, received at the same time, show no deposit whatever. The specimens are not subjected to any very high temperature.

A sample of Baros camphor corresponding to the first quality described above has been in our possession for about twenty years, and was presented to us by the late Prof. Procter, who, we believe, received it from the late Daniel Hanbury. The bottle is kept in a closet, where during the summer the temperature may reach occasionally 95 or 100° F.; during the first ten or twelve years no sublimate was observed, but since that a moderate amount of crystals has formed in the upper part of the bottle.—EDITOR AMER. JOUR. PHAR.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Treatise on Practical Chemistry and Qualitative Inorganic Analysis, adapted for use in the laboratories of colleges and schools. By Frank Clowes, D. Sc., Lond., etc. With illustrations. From the fourth English edition. Philadelphia: Lea Brothers & Co., 1885. 12mo, pp. 376.

We may simply repeat the favorable opinion which we expressed after the examination of a previous edition of this work (see "Am. Jour. Phar.," 1881, p. 143). It is practical in its aims and accurate and concise in its statements. Slight changes in the arrangement were very judiciously made. Thus the first section now treats of the preparation and use of apparatus, which are necessary in performing the experiments with certain gases and liquids, described in section II; the use of the spectroscope has been transferred from the appendix to the analytical operations in section III, etc. Among the new matter added in the present edition, may be mentioned in section VI the reactions of various organic matters, such as alcohol, starch, glucose, urea, albumen, six of the most important alkaloids, and nine organic acids; the latter, we think, would be more conveniently considered with tartaric and other organic acids in section IV, and the number might be increased by cinnamic and malic acids, which are frequently met with.

But these transpositions and additions do not represent the only or main changes in the present edition; of far greater importance is the care which

has evidently been bestowed upon the book, so as to keep it abreast of modern science, and to render it still more useful as a guide to the beginner in chemical analysis.

Commercial Organic Analysis. A treatise on the properties, proximate analytical examination and modes of assaying the various organic chemicals and products employed in the arts, manufactures and medicine; with concise methods for the detection and determination of their impurities, adulterations and products of decomposition. By Alfred H. Allen, F. I. C., F. C. S., etc. Second edition, revised and enlarged. Vol. I. Introduction, alcohols, neutral alcoholic derivatives, sugars, starch and its isomers, vegetable acids, etc. Philadelphia: P. Blakiston, Son & Co., 1885. Svo, Pp. 476. Price \$4.50.

On the appearance of the first edition this work was received as a most valuable one, and the extent to which it has been used as a guide for determining the commercial purity of organic substances has shown it to be practical and reliable; for it contained not only the results and observations of the author's extended experience, with analytical processes, but the literature on the subject matter had been carefully scrutinized and adapted to the plan of the work. In these respects the second edition now before us is fully equal to the preceding one, and will doubtless prove to be an equally trustworthy guide, embodying pretty much all the information known on the subject up to the time of placing the work in the printer's hands.

A rearrangement of the material has been found desirable, and the increased scope and numerous necessary additions will enlarge the work to three volumes, instead of two as heretofore. The first volume is now before us, and its contents are as above indicated. The introductory portion treats of the various operations and apparatus for the examination and analysis of organic bodies. The alcohols considered are methyl, ethyl and amyl-alcohol, and alcoholic beverages and liquids. The alcoholic derivatives embrace the ethers, aldehydes, chloral and chloroform. About 130 pages are devoted to the various kinds of sugar, 60 pages to vegetable fibres, starch, dextrin and gums, and the remaining 90 pages to the commercial organic acids and their salts. The processes by which these articles are prepared, are briefly given, then their properties, followed by the means for identification and tests of purity, the information on these latter topics being quite exhaustive.

The remaining volumes which are promised to follow in rapid succession, will contain the following subjects: Vol. II. Fixed oils and fats, tannins, hydrocarbons, phenols and their allies and derivatives, coloring matters, etc. Volume III. Cyanogen compounds, alkaloids and organic bases, albuminoids, etc.

List of Tests (Reagents) arranged in alphabetical order according to the names of the originators. Designed especially for the convenient reference of chemists, pharmacists and scientists. By Hans M. Wilder. New York: P. W. Bedford, 1885. 12mo, pp. 88. Price \$1.

We are greatly pleased to observe that the little pamphlet which we noticed on page 56 of this volume has been speedily followed by a more ex-

tended list, prepared by Mr. Wilder with his noted care. The list enumerates 870 tests, which are in most cases briefly described, sufficiently so for application; in those cases requiring lengthy details, references are given to American or English publications, where these details may be found. A full index by subjects enhances the usefulness of the little work, which is of particular value to the readers of chemical literature in which reference to such tests is frequently made. We have carefully examined a large number of the quotations and found the statements to be correct. The author of the nitroprusside of copper tests for volatile oils is G. S. Heppé, who recommended it in 1855 for the detection of adulterations of oxygenated oils with oil of turpentine and similar hydrocarbons, these adulterations preventing the color reactions of the oxygenated oils with the reagent; the statement under No. 334, while essentially correct, we think should be modified by adding the behavior of oil of turpentine.

An Outline of a Course of Study in Practical Pharmacy. By Oscar Oldberg, Phar. D., Professor of the theory and practice of pharmacy, and director of the pharmaceutical laboratory of the Chicago College of Pharmacy. Published by the author, 1885. 12 mo, pp. 104.

This little work covers the ground pretty thoroughly, giving the skeleton of an extended course in practical pharmacy, in which nothing seems to have been omitted, that may tend to familiarize the student with his work; but on the contrary he is frequently led to study the same subject from different views, as may be seen, for instance, from the tables giving a classification of drugs according to their constituents, or from the enumeration of preparations made by various processes. The contents of the work may be briefly summarized as follows: Introductory portion, relating to legislation, education, pharmacopœias and metrology; manipulations; inorganic chemistry; organic chemistry; organic drugs and their constituents; pharmaceutical preparations; extemporaneous pharmacy and finally laboratory work. The book is almost entirely suggestive, the more important points relating to each subject being merely indicated, so as to show the student the direction which his studies should take. For those who do not attend lectures, the author has indicated in the preface the order in which the experimental illustrations may be combined with a course of studying from books.

Proceedings of the California Pharmaceutical Society and College of Pharmacy for the years 1883 and 1884; also *Proceedings of the Alumni Association*. San Francisco: 1885. 8vo, pp. 133.

This contains a number of papers and abstracts of theses, to the more important of which we shall refer in another place.

Twenty-first Annual Report of the Alumni Association, with the exercises of the 64th Commencement of the Philadelphia College of Pharmacy, for the year 1884-85. 8vo, pp. 188.

The frontispiece consists of a well-executed phototype of Edward C. Jones, who was one of the projectors of the Alumni Association, has served as its treasurer for 17 years, and has always been untiring in efforts to promote its usefulness. As usual, the volume contains the minutes of meetings, and the various addresses and lectures delivered during the past year.

Proceedings of the Connecticut Pharmaceutical Association at the ninth Annual meeting held in Hartford February 3 and 4, 1885. Also the constitution, by-laws and roll of members. 8vo, pp. 87.

A brief account of the meeting was published on page 360 of our July number.

Sanitary suggestions on How to disinfect our Homes. A resumé of the latest and best information on the household use of disinfectants, deodorants and antiseptics, and of practical precautions preventive of cholera, diphtheria, scarlet fever and other infectious diseases. Prepared for popular perusal by B. W. Palmer, A.M., M.D. Detroit: George S. Davis, 1885. Pp. 58. Price 25 cents.

A timely publication, which deserves to be widely known and read.

Hay Fever and its successful treatment by superficial organic alteration of the nasal mucous membrane. By Charles E. Sajous, M.D., etc. Philadelphia: F. A. Davis, Att'y., 1885. 12mo, pp. 103.

This essay was read before the Philadelphia Laryngological Society in April and discusses the causes of hay fever and its treatment, the latter consisting, in order to effect a permanent cure, in cauterizing by means of galvano-cautery or acids the hyperæsthetic portions of the nasal mucous membrane. The little book is well written and handsomely printed, and contains 13 good wood cuts, illustrating the various instruments and the operations.

Second Report of the State Board of Health of the State of Tennessee. October, 1880 to December, 1884. Published by Authority. Nashville: 1885. 8vo, p. 600.

Contains numerous official reports on sanitary subjects.

The physiological and medicinal action of fluoric acid and the fluorides. By L. A. Waddell, M.B., Surgeon I.M.S., etc. Calcutta. Pp. 112.

A reprint from the "Indian Medical Gazette," 1883. The hydrofluoric acid experimented with was $\frac{1}{2}$ per cent. solution, the dose of which is 10 minims to 2 drachms, vomiting being excited by $\frac{1}{2}$ ounce. The alkaline fluorides are more advantageously used than the acid, in doses of $\frac{1}{4}$ grain to 3 grains, emesis resulting from doses of 6 grains and upwards. These salts are incompatible with the salts of calcium, lead and other metals; they should be diluted and given after food to relieve the nauseating after effects. Extract of liquorice was found to be the best corrective of taste. Solutions of ammonium fluoride should be kept in glass bottles coated with wax on the inside.

Practical Results from the Study of the preservation of Alimentary Substances. By Filippo Artimini. Florence, 1885. 4vo, pp. 24.

The author claims having discovered a process for the preservation of carcasses of animals in the fresh state without the use of ice; the material used is not mentioned. The pamphlet is printed in two languages, Italian and English.

Friedrich Wöhler. By Prof. F. B. Power. Pp. 14.

A well written biography, reprinted from the "Western Druggist," May, 1885.

International Electrical Exhibition, 1884. General report of the Chairman of the Committee on Exhibitions.

Report of Examiners of Sections V, VI and VIII (Electric lamps; carbons for arc lamps.)

Report of Examiners of Section X (Steam boilers.)

These three reports are illustrated. The Franklin Institute of Philadelphia, under whose auspices the Electrical Exhibition was held, has made arrangements for a Novelties Exhibition to be held in Philadelphia, from September 15 to October 31, 1885.

VARIETIES.

TROCHES OF HÆMOGLOBIN.—Benzur ("Dtsch. Med.-Ztg.") reports upon the hæmoglobin treatment as carried on in von Ziemssen's clinic. Troches were prepared from ox-blood. The daily amount of hæmoglobin given was about twenty-five grains. Not only was there a marked improvement in the cases of anæmia thus treated, but no gastric disturbance was observed, such as follows the administration of large doses of iron.—*N. Y. Med. Jour.*, May 30, 1885.

PILLS OF OIL OF THYME.—The "Bulletin général de thérapeutique" gives the following for rheumatism:

Volatile oil of thyme.....	10 grains;
Soap.....	10 "
Powdered althæa.....	q. s.

Divide into six pills. Two to be taken before each meal.

DIARRHŒA MIXTURE.—Dr. E. X. Veat, of Portland, Maine, has used the following formula in his practice, with most excellent results:

R	Extracti hæmatoxyli.....	ʒ iv
	Tinct. opii camph.....	ʒ j
	Tinct. zingiberis.....	
	Tinct. rhei comp.....aa	ʒ ss

M. Dose, a teaspoonful every two or three hours.—*New Eng. Med. Monthly*, May, 1885.

ANTI-RHEUMATIC MIXTURE.—Dr. H. K. Lines has obtained good results with the following:

R	Vini colchici sem.....	ʒ ss
	Tincture gentian. comp.....	ʒ iiss
	Potass. iodid.....	ʒ ij

Mix. Sig. Teaspoonful three times a day in a wine glassful of water.—*New Eng. Med. Monthly*, May, 1885.

THE AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1885.

SODIO-BISMUTH TARTRATE AND PEPSIN.

BY R. ROTHER.

That the profession of pharmacy is the natural custodian of the Pharmacopœia admits of no doubt. It does infinite credit to the medical profession to recognize and concede this fact. Now, whilst medicine has gracefully yielded full scope to the proper function of pharmacy, it cannot be said that pharmacy has been equally considerate to accept its rightful limits. Hence, as the imperfections of the system of medicine, pertaining to its agencies, are grievous obstacles to its own progress, it comes with rather ill grace from the system of pharmacy to prescribe its methods, or even to absorb its functions.

When the imperfections and irregularities of any system are very great, and out of all correspondence with the surrounding conditions, the time of its certain extinction is not remote. When, however, a system evinces considerable persistence, and shows some indications of general improvement, the probabilities are that the correspondences are numerous, and that the ill adapted and unadaptive features will eventually disappear.

A system of the first kind will be displaced in its totality by better systems. A system of the second kind will maintain itself by retaining its perfect parts and displacing all others by more correspondent portions. These various changes are necessarily slow, which to many seems insufferable.

The transition from the less to the more ethical presents all degrees of their mixture, and hence there is no time or place where the wholly unethical ends and the wholly ethical begins. This is a general principle, and holds universally, be it in a system, organism or individual.

In the two systems of medicine and pharmacy there is much of a certain irregularity termed quackery; but, where there is a relatively large amount of crudity, even coexistent with a forward tendency, as in these two cases, it is very difficult to find many individuals suffi-

ciently capable and right minded to escape the stigma wholly. As elsewhere, the discordant elements are here, sorted out in the general test of fitness; the gradual augmentation of better and better individuals incidentally perfects the whole. This makes it clear that quackery is but a relative term, and that it is by no means as special as it would seem.

The system of pharmacy, as voiced by its Pharmacopœia, declares that an extensive class of preparations, conventionally termed "scientific specialties," are essentially unscientific, that all endorsement of them should be withheld, and that their manufacture should be emphatically and systematically discouraged. Now, it is one of the best known facts in the business of pharmacy that the annual consumption of this class of goods is an enormous aggregate, and that physicians, by a large majority, and among them the most prominent, lavishly employ them. Even granting their utter worthlessness, it is presumption, to say the least, for pharmacy to decide this question. Under the circumstances, there is no better method calculated to perpetuate this so-called evil than to antagonize it by attempting to ignore it.

The Pharmacopœia at each revision incorporates long lists, and among them whole classes of articles that are scarcely known in a general way, and much less used. In consequence of this procedure each revision is also characterized by the dismissal of lists of articles equally long. In the main, there is obviously little difference between the members of the two lists; the only reason for the change seems to consist in giving all ephemerides a chance. It is, however, with the greatest difficulty that well-known and long popular material is admitted. This opposition even manifests itself in the dismissal of approved and staple compounds, of which at least a dozen can be readily enumerated. Now, whilst the last revision is especially characterized by an unusual addition of obsolete and absolute lumber, the most urgent needs have been mainly neglected. For instance, the rubber plasters should have been recognized; a much desired formula for carbolic oil was omitted; the highly useful and popular powdered extracts were forgotten; the long staple and nearly indispensable extract of meat, and its various adjunct compounds, were ignored; the favorite so-called acid phosphates, nutritive phosphates and albuminates should have been acceptably considered; emulsions in general and the highly popular and strongly staple emulsions of cod liver oil with adjunct compounds remained utterly unnoticed; the most con-

spicuous and important of all, the highest development of modern galenical pharmacy, the compound elixirs, were deliberately frowned down.

Now, in regard to most of these, and others similar to these, not mentioned, it can be said that their adoption would directly oppose the science and ethics of pharmacy, and that such endorsement would virtually pervert, if not obliterate, the progress of scientific pharmacy. Furthermore, it can be added that this system of ready-made prescriptions would not only intensify the irregular specialist evil, but would also react most injuriously on the practice of medicine itself. But, in answer, it can be said that the specific structure of the medical system is of no legitimate concern to pharmacy, and if the physician insists on demanding this, that and the other form of combination, the pharmacist can do no better than furnish the desideratum with the greatest possible alacrity and grace.

Now, the indubitable fact is there, and a very potent one, that there is a large demand for these products, and that they are continuously forthcoming, in utter contempt of the Pharmacopœia. Of course the system of pharmacy, if sufficiently co-ordinated, and consequently agreed upon standards, can dispense with the Pharmacopœia. But the purpose of the Pharmacopœia is to unify and authorize these standards, and hence the performance of this function consists in codifying the expressed law of the system. With this result achieved in perfect correspondence with the living tendencies, the obnoxious specialist must now subject his products to the dimensions of the standard, and change his identity accordingly, or wholly disappear.

If the system of medicine, with its modern agencies, is so entirely at variance with its environment that the correspondence, if any, is of the most imperfect kind, it will speedily be supplanted by a better system; but if the most essential parts are in the closest relation, and other important portions are yet more or less discordant, the necessary improvement will slowly follow. The extraneous system of pharmacy can exert little or no influence in this connection, but it cannot possibly do better for itself than modulate its own activities in sympathy with these changes.

The Pharmacopœia has incorporated pepsin as an official agent. It has given an excellent description of the article, but an excellent process for its preparation would have been infinitely more desirable. Most of the saccharated pepsin of commerce is chiefly dried mucus,

and its odor and taste are therefore comparably bad. A solution of pepsin is also official, but, in the writer's opinion, this is too acid and too dilute. The proportion of glycerin, when a full dose is given, is so great that it cannot fail to cause gastric distress. The proportion of pepsin can easily be tripled or quadrupled so that then a maximum dose will not contain an excessive amount of glycerin. All indications tend to show that pepsin in very acid solutions soon deteriorates. It has been asserted with much stress that alkalies destroy pepsin. This is true only of very concentrated alkali; weak alkali, under a moderate period of exposure, does not perceptibly injure pepsin.

The pepsin whilst in the gastric glands is neutral, and possibly alkaline. It becomes acid only as it emerges from the ducts. Furthermore, the chief activity of the natural pepsin is exerted on the partially digested proteids after their entry into the alkaline intestinal fluids. In many cases of gastric disturbance the cause is said to be an excess of the natural acidity. On such occasions, an additional increment introduced with the pepsin must be prejudicial than otherwise. Hence, for these various reasons, the writer believes that, in addition to enhanced concentration, the solution should contain a minimum proportion of acid, consistent with complete solution of the pepsin.

The Pharmacopœia allows only 24 hours for the solution of the pepsin, which time appears insufficient. The writer, however, proposes an entirely new method, by means of the agency of heat. Under this new procedure one part of saccharated pepsin will perfectly dissolve during less than one hour's time in four parts of water containing one-eighth part of diluted chlorhydric acid, at a temperature not materially exceeding 40°C. The resulting solution obtained with a pepsin practically free from mucus will be void of sediment and but slightly opalescent. It will filter with uniform but only moderate speed to the end, and better without than with glycerin. The first portions passing through the filter are always turbid, and must be returned until the liquid drops perfectly clear. The glycerin is added to the filtrate in the proportion of a third or not less than three-tenths of the whole volume after mixture. The solution should represent one gram of saccharated pepsin in eight cc. or fluid grams. The preparation is much improved by employing orange flower water in the proportion of one-fourth of the finished volume. When a pepsin containing an admixture of mucus is used this impurity settles rather

compactly, so that after a moderate duration of repose the supernatant liquid may be decanted quite free from sediment. The mucus should be kept out of the filter, as it greatly impedes filtration. A solution of pepsin contaminated with mucus becomes more malodorous with age. The odor, however, does not possess a putrid character, neither does it resemble in intensity and obnoxiousness the perfectly execrable stench of the so-called scale pepsin. The odor caused by the presence of mucus seems to emanate from an acid body. Neutralization of the solution extinguishes the odor instantaneously and completely. On the slightest acidulation it as promptly and intensely reappears. Such a pepsin when dry is also immediately deodorized by the admixture of subnitrate of bismuth.

The writer believes that the Pharmacopœia should incorporate a process for the preparation of pepsin. It should direct the washed membranes to be extracted with a large volume of cold acidulated water. The practically clear macerate should then be treated with sodium chloride to saturation. The precipitated crude pepsin should then be collected, pressed into thin sheets, and dried in the open air. The dried residue should then be cut into shreds, and after rinsing with cold water be treated with about 40 parts of water containing one part of diluted chlorhydric acid, at a temperature not much in excess of 40°C., during the period of one to two hours. The nearly clear supernatant liquor is then mixed with a relatively large volume of filtered saturated solution of sodium chloride. The reprecipitated pepsin is then collected, pressed, mixed with some lactose, dried in the open air, powdered, and after assay mixed with lactose or either saccharose, so that the finished article contains about ten per cent. of real pepsin.

Whether pepsin has or has not any medicinal value is, in a pharmacinal aspect, of no consequence. The consideration to pharmacy is, does the medical system call for such goods, and can the articles be furnished?

A mixture of dry pepsin and subnitrate of bismuth is very popular with all practitioners, almost without exception. In consequence, a liquid form became desirable. This solution was then compounded with strychnine, and has in this form, as an elixir, become to be a great staple.

It appears that pepsin enters into chemical combination with various bismuth salts, some of the compounds being soluble and others insoluble. When a solution of ammonio-citrate of bismuth, representing 1 gram

of the normal citrate in 3 fluidgrams is mixed with a strong solution of pepsin, a dense gelatinous magma is formed, which readily dissolves on dilution. This soluble compound appears to be present in all alkaline, neutral or but slightly acid solutions prepared with the ammonio-citrate. Unless very alkaline, all of these solutions will eventually deposit most of the normal citrate in crystalline crusts. Alkaline solutions are also apt to deposit some of the bismuth as metal and the remainder as citrate. The various preparations of the market possess these characters in different degrees, having probably all a similar origin. A permanent acidulous solution has long been a desideratum.

The writer found ("American Journal Pharmacy," June, 1884) that bismuth citrate unites chemically with borax, forming a permanent solution having a decided acid reaction. But an admixture of pepsin solution causes a perceptible flocculent precipitate, possibly containing pepsin.

On treating one m. of dipotassio-bismuth citrate with one m. of boric acid an alkaline solution results. With two ms. of boric acid an acidulous product is obtained. Neither of these two compounds appears to disturb pepsin solutions, but both are objectionable from lack of sufficient acidity when united with pepsin in solutions more than ordinarily concentrated.

The writer found ("American Journal Pharmacy," July, 1884) that a certain proportion of monopotassio-bismuth citrate mixed in solution with the dipotassio salt imparted an acid reaction. The mixture formed permanent solutions with pepsin, and the writer gave a formula for such a preparation. This produced necessarily a weak form, and trial showed that a much more concentrated result with the desired acidity could not be obtained.

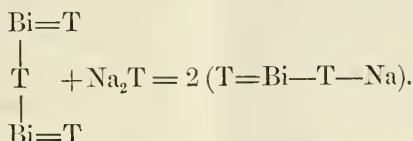
Owing to the intractable nature of the bismuth citrate in this connection the writer concluded to avoid its use, and find a more suitable bismuth salt to take its place.

The next experiments were made with tartaric acid. The writer could find nothing in text-books relating to the existence, the composition and preparation of a tartrate of bismuth. Bismuth oxynitrate or bismuthyl nitrate when heated with tartaric acid does not suffer decomposition, and hence no tartrate is formed under these conditions. When aided by some nitric acid a corresponding proportion of tartrate forms. When, however, enough nitric acid is added, so as to render the whole of the basic salt available, a perfect solution results. On

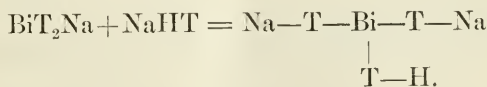
now gradually neutralizing the excess of nitric acid by means of sodium or potassium bicarbonate a seemingly crystalline normal bismuth tartrate precipitates. After about three-fourths of the nitric acid present has been neutralized all the bismuth will be converted into tartrate and thrown out of solution.

The writer deems this precipitate a normal salt, but has not determined its composition, and hence cannot state whether it is a hydrite or not. Its provisional formula may with great probability be indicated as $\text{Bi}_2\text{T}_3 \cdot x \text{Aq.}$

Different from the citrate, the tartrate enters into permanent and definite chemical union with normal monad tartrates, but in addition also forms basic or hydro-tartrates. The writer ascertained that the tartrate formed from a definite amount of bismuthyl nitrate, dissolved in a definite amount of normal sodium tartrate. The proportions were such that the salts reacted, molecule for molecule, as expressed by the following equation :



This double salt has a decided acid reaction. On evaporating its solution it is obtained in colorless transparent, non-deliquescent and readily soluble scales. Its composition as to water was not determined. A small proportion of tartaric acid has no effect upon this double salt, but a large amount appears to decompose it. When, however, an excess of normal citrate is present, tartaric acid may be added to any extent without effect. A new acid double tartrate evidently forms under these conditions, as follows :



If a solution of the normal double tartrate is added to a neutralized solution of pepsin, a voluminous precipitate appears in gelatinous flakes. On the addition of sodium bicarbonate, this precipitate promptly redissolves, leaving a solution which still retains a decided acid reaction. It is also a remarkable fact that the addition of tartaric acid does not now cause a reappearance of the precipitate.

These results and the subsequent products obtained by them show

that a concentrated and decidedly acidulous but, above all, permanent solution of bismuth and pepsin can be produced.

When the composition of the normal bismuth tartrate and the normal sodio-bismuth tartrate have been determined, and either of these salts can be readily procured in the open market, the production of bismuth and pepsin solutions will be greatly facilitated and simplified. In the meantime the preliminary preparation of the bismuth tartrate must constitute part of the process.

The writer believes that an elixir will be the most acceptable form, and that it should possess the concentration which the prevalent doses of the compounds of the market indicate; that is, one teaspoonful of the elixir should contain an average dose of each ingredient.

In the formula which the writer proposes, orange flower water is used, as this is more durable and acceptable than the aromatic jumble that is generally employed. Glycerin is used instead of sugar, since it is presumed to aid in retaining the activity of the pepsin. Alcohol is added to keep the proportion of glycerin at a minimum. The preparation is compounded with strychnine, as this form is by far the best known and most popular. The preparation is adjusted by volume, and each teaspoonful represents about eight grains of saccharated pepsin, the equivalent of one grain of bismuth citrate, and about one-sixty-fourth of a grain of strychnine. The formula is as follows:

Pepsin, saccharated.....	100 grams.
Bismuth subnitrate.....	10·5 “
Strychnine.....	·21 “
Chlorhydric acid, diluted.....	12·5 f. grams.
Alcohol.....	50 “
Glycerin.....	200 “
Orange flower water.....	200 “
Nitric acid.....	..
Tartaric acid.....	..
Sodium bicarbonate.....	..
Water.....	of each sufficient to make 800 fluidgrams.

Mix the bismuth subnitrate with 40 fluidgrams of water, and gradually add nitric acid, with constant stirring, until a clear solution is obtained. To this now add 7·65 grams of tartaric acid and 80 fluidgrams of water. The solution is then treated with sodium bicarbonate until about three-fourths of the nitric acid is neutralized. The crystalline magma of bismuth tartrate is now poured upon a plain filter and washed with water till practically free from nitric acid. Now

mix 2.9 grams of sodium bicarbonate with 5 fluidgrams of water, and gradually add 2.55 grams of tartaric acid. With this solution mix the washed bismuth tartrate and stir them together occasionally until a clear solution has resulted.

Mix the diluted chlorhydric acid with water to the measure of 200 fluidgrams, and add the orange flower water. Pour this mixture upon the saccharated pepsin, and transfer the resulting magma to a bottle having double the capacity; cork it well, and immerse it in a water-bath having a constant temperature of 40°C. for the time of one hour, shaking the bottle at intervals. Pour the resulting pepsin solution into a beaker, or graduated measure, and add sodium bicarbonate until neutralization is effected. To this liquid then add the solution of bismuth sodio-tartrate, and carefully follow with more sodium bicarbonate until the gelatinous precipitate which had formed is redissolved. Now incorporate the strychnine and 2 grams of tartaric acid; transfer the solution to a filter, returning the first turbid portions that pass, and when all the liquid has passed through follow with water, if necessary, through the filter, so that the filtrate measures 550 fluidgrams. To this now add the alcohol and glycerin previously united, and mix the whole.

Opionin is a body obtained by O. Hesse from Smyrna opium, by treating it at ordinary temperature with an excess of milk of lime, supersaturating the solution with excess of acetic acid and concentrating to a weight equal to that of the opium. The brown flocculent mass which separates contains gypsum, and yields to ammonia the opionin, which is precipitated from the filtrate by hydrochloric or acetic acid. It forms concentric groups of small needles, melts and turns brown at 227°C., is easily soluble in alcohol and ether, sparingly soluble in boiling water, is neutral to test paper and seems to be free from nitrogen. Its solutions in alkalis are yellow, but acids separate it as a nearly colorless crystalline precipitate. On warming its alcoholic solution yields with ferric chloride a flocculent brown-red precipitate. On boiling its solution with lime, a crystalline acid soluble in water and ether is formed. On melting opionin with potassa, *opionylie acid* is formed which is likewise freely soluble in water and ether and crystallizes in dense colorless prisms.—*Liebig's Annalen*, vol. 228, p. 299–300.

THE FRUIT OF *ILlicium ANISATUM*, LOUREIRO.

BY CARL E. SCHLEGEL, PH.G.

From an Inaugural Essay.

The glossy brown-yellow seeds were removed, and the capsules reduced to a No. 80 powder. This powder, dried at 100°C., until it ceased to lose weight, was found to contain 10.36 per cent. of moisture and volatile oil. On incinerating this dried powder there remained 3.5 per cent. of *ash*, the acid solution of which showed that there were present the bases: K, Na, Fe and Al; also hydrochloric, sulphuric and phosphoric acids.

A proximate analysis of the drug, gave the following results:

Portion soluble in petroleum spirit.—Twenty gm. of powder were exhausted with petroleum spirit by repeated maceration and decantation, and the petroleum spirit distilled off, until 200 Cem. remained. A portion of it was allowed to evaporate spontaneously, the residue amounting to 5.875 per cent. of the whole, which residue had the appearance of a thick oily dark-green liquid, of a strong distinct anise odor. On adding strong sulphuric acid to a solution of a portion of it in chloroform, it turned yellow, then brown, and rapidly deep red. These characteristic colorations, combined with its odor, proved it to contain oil of star anise.

To another portion of the liquid, 95 per cent. alcohol was added, which completely dissolved it. On adding to this alcoholic solution a solution of sodic hydrate, applying moderate heat, and shaking it, it failed to saponify, proving the absence of fixed oil.

The liquid was found to contain 4.675 per cent. of volatile oil. On heating in a water-bath at 100°C. a portion of the liquid, for eight hours, this volatile oil was all driven off, and then remained 1.2 per cent. of green wax, fusing at 51°C.

Portion soluble in stronger ether.—The residue from the petroleum spirit extraction, dried and freed from all traces of petroleum spirit, was exhausted with stronger ether by maceration and decantation, and the liquid then subjected to distillation until 200 Cem. remained in the retort. This was allowed to evaporate spontaneously, and there remained a solid residue of 1.2 per cent. Of this residue 30 per cent. was soluble in water, and 70 per cent. soluble in absolute alcohol. The aqueous solution gave with ferric chloride an inky greenish black

color; with gelatin no precipitate; with lead acetate a grayish precipitate; and with ammoniac hydrate a green color, immediately changing to reddish-brown. From these reactions it may be inferred that the aqueous solution probably contained gallic acid. The portion soluble in absolute alcohol was found to be a resinous substance, partially soluble in aqueous solution of caustic potassa.

Portion soluble in absolute alcohol.—The residue from the ether extract, dried, was exhausted with absolute alcohol, and from the tincture the alcohol was distilled off, until 200 Cem. remained. This was allowed to evaporate spontaneously and left a residue amounting to 3.75 per cent. This residue was completely soluble in distilled water. The aqueous solution of this residue was then made acid in reaction, and successively shaken up with petroleum, benzol, ether and chloroform, but gave no noteworthy results.

After having removed from this aqueous solution all traces of the other solvents, it was made alkaline. Upon shaking this solution with petroleum, decanting the petroleum, and evaporating spontaneously, there remained a crystalline principle of very strong musk odor, but which corresponded neither to the reactions of an alkaloid, nor those of a glucoside. Subsequent shakings with benzol, ether and chloroform, showed nothing of value.

Portion soluble in distilled water.—The residue from the alcohol extraction dried, was exhausted with distilled water by maceration and on evaporation, and drying a portion of this liquid in a water-bath, the residue amounted to 0.94 per cent. A portion of the aqueous extract was acidified and successively agitated with petroleum, benzol, ether and chloroform; but on evaporating these several shakings no crystalline residue was observed. This same portion was then carefully heated to expel all traces of the other solvents, and was then made alkaline. Here likewise, no results were obtained by agitating with the same solvents.

To 20 Cem. of the aqueous extract, 35 Cem. of alcohol (95 per cent.) were added, and allowed to stand in a cool place for twenty-four hours. It was found that all the gum had been precipitated, which precipitate was then removed to a filter, and washed with alcohol of 66 per cent, carefully dried to a constant weight, the gum was found to amount to two per cent. of the whole. It was completely soluble in water, and formed a mucilage therewith.

The acid taste of the aqueous extract, and its frothing, when shaken

up, indicated the possible presence of saponin, hence the necessary tests were made as follows: To a portion of the aqueous extract, baryta-water was added, and this allowed to stand in a cool place for forty-eight hours. This caused quite a large precipitate, which was removed to a filter, and repeatedly washed with saturated baryta-water. The precipitate was then removed from the filter, mixed with a little distilled water, and carbonic acid gas passed into it. This broke up the compound, which had been formed with the baryta, and the principle remained in solution. The filtrate was shaken up with chloroform, which took up the principle from its watery solution, and on evaporating left it in an amorphous condition. In contact with a few drops of concentrated sulphuric acid, after some time it gradually assumed a reddish color. A portion of the principle in solution was boiled with a little acid, and then treated with freshly prepared Fehling's solution; the blue color immediately changed to green, and a brownish-red precipitate, consisting of cuprous oxide resulted. A portion of the solution formed an insoluble compound with basic acetate of lead. All these reactions go to show that the principle in question was the glucoside saponin.

Syzygium Jambolanum, *De Cand.* The fruit of this tree is stated by Banetralla to have been used with good results in glycosuria, causing within 48 hours after its administration a considerable decrease in the amount of urine, and a complete disappearance of sugar. The rind of the fruit is said to contain the active principle ("Rev. de Thérap.," "Lond. Med. Record").

The medicinal uses of this tree have been briefly referred to in this Journal, 1882, p. 351. Its leaves differ from those of most other myrtles in not being pellucid punctate; they are short petiolate, 3 or 4 inches long, smooth, leathery, varying between oval and obovate-oblong, and between acuminate and very obtuse, the West Indian form being rounded at the apex. The flowers are in lateral panicle cymes, clustered and have the calyx limb truncate or nearly entire. While the ovary is two-celled and multiovulate, the berry is one-celled and contains only one or a few seeds. The seed is globular and the embryo consists of two fleshy hemispherical peltate cotyledons, the short radicle being attached to their lower half, and concealed between them.

J. M. M.

MENTHOL.

Brief Abstracts from Theses.

Elmer B. Kyle, Ph. G. mentions the following among the properties of menthol. When thrown upon water currents are produced to and from the dissolving crystals, similar to the motions observed under the same condition with camphor. Menthol liquefies with chloral, thymol and camphor, and this action is particularly noticeable with thymol, crystals of the two substances, placed in contact, being in a few minutes transformed into a thick oily liquid. On gently heating a mixture of one drachm of the aqueous solution of menthol with half a drachm of a solution of one grain iodine and five grains potassium iodide in two drachms of water with a small quantity of potassa solution, the characteristic odor of iodoform is observed. The aqueous solution is not disturbed by ferric chloride or bromine water, but yields a slight turbidity with chlorine water. One grain of menthol yields, with 120 drops of sulphuric acid, a brownish-red liquid of a very disagreeable odor, and on the addition of a little potassium bichromate becomes chrome-green, the color remaining unaltered for several weeks. Menthol slightly warmed with nitric acid yields a thick wine colored oily liquid, and at a higher heat red fumes are given off; on neutralizing now with ammonia, a precipitate was observed, which was soluble in alcohol, the solution, when evaporated yielding an indistinctly crystalline mass.

Frank T. Landis, Ph. G., gives a history of the preparation of the oil and of menthol in Japan, and of the chemical and medical properties of menthol.

Wm. J. Laval, Ph. G., examined two samples of Japanese menthol and one of pipmenthol, and found them to differ mainly in the fusing point which for the latter was 40°C and for the two other specimens 35° and 36.5°C . The specific gravity was .9002 and .9004, and for pipmenthol .9003. At 39°C . 1 Gm. of alcohol dissolved 8.327 Gm. of menthol, and 20 Gm. of water took up .031 Gm. of menthol. This is insoluble in hydrochloric acid, not affected by alkalis, sparingly soluble in glycerin, somewhat soluble in warm acetic acid, decomposed on being heated with nitric acid, the mint odor disappearing almost entirely, and under the influence of hot sulphuric acid is changed into a dark brown or black liquid.

Bromine reacts violently with menthol, vapors of hydrobromic acid being given off, while a dark purplish oily liquid remains. From the solutions in ether or chloroform menthol is obtained in feathery or somewhat stellately arranged needles. Sodium introduced into melted menthol, liberates hydrogen and a glassy mass is left, which on exposure becomes brown, opaque and deliquescent.

A very good vehicle for the application of menthol is oleic acid in which it is freely soluble, and as an application in toothache a solution is very serviceable in the proportion of 20 grains of menthol in one and a half drachms of chloroform.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from page 389.)

Cardo santo, *Cirsium mexicanum*, *De Cand.*; *Compositæ*. The leaves and flowers are used in place of the European blessed thistle, and possess stomachic, febrifuge and sudorific properties; the flowers also that of coagulating milk.

Carrizo, *Arundo Donax*, *Lin.*; *Graminaceæ*; grows in Mexico and other countries. The rhizome is sudorific and diuretic.

Cascalote, *Cæsalpinia coriaria*, *Willdenow*; *Leguminosæ*; in hot and humid regions of the western slope of the Mexican Cordillera. The fruit, which, according to P. Alcocer, of Mexico, contains 30 per cent. of tannin and 17 per cent. of gallic acid, is used for tanning, and in medicine as an astringent.

Cebadilla de Tierra caliente, *Veratrum officinale*, *Schlechtendal* (*Asagraea tenuifolia*, *Martius et Galcoti*). The capsules are three-celled, papyraceous, light reddish gray, the cells several seeded, and the seeds blackish, sword-shaped, rugose, sharp-pointed, of a bitter and acrid taste, and produce a copious flow of the saliva.

Cebadilla del Interior, *Veratrum Sabadilla*, *Retzius* (*V. virescens*, *Mart. et Gal.*). The fruit differs from the preceding in being more rounded and like the seeds of a darker color.

Cebadilla del Valle de México, *Veratrum frigidum*, *Schlechtendal*. The capsules are much larger and longer, and of a lighter color, like the seeds, which assume a yellowish tint and are collected before completely ripened.

The bulbs of the three plants are known in Mexico as cebolleja, cebolleta or cintul, are used like the fruit, and are believed to possess identical properties, but they have not been analyzed. The fruit is rarely employed internally; the powder is used as an insecticide and errhine, and the tincture as a stimulating embrocation. The capsules of *Pentstemon barbatus* and other species, known as chilpantlaeol, are sometimes fraudulently substituted for the former, but are easily distinguished by the grayish yellow color, a somewhat horny texture, and the numerous seeds, which are not sword-shaped. The more important botanical distinctions between the two fruits are as follows: The capsules of the *veratrum*s become three-lobed, and separate into three carpels, opening by their ventral sutures, while the capsules of *pentstemon* are two-celled, have a central placenta, and open by four valves.

Cedro colorado, *Cedrela odorata*, *Lin.*; *Meliaceæ*; in hot localities of Mexico. The bark is very bitter, and is reputed to be febrifuge and anti-epileptic; the decoction of the leaves is used for curing tooth-ache, and the resin is employed in bronchitis.

Cedron, *Lippia citriodora*, *Kunth*. See July number, p. 333.

Ceiba, *Ceibo*, *Eriodendron anfractuosum*, *De Candl.*; *Bombacæ*; in Tamaulipas, Yucatan and other hot and damp regions of the Republic. The cotton investing the seeds is used for stuffing cushions, etc.

Cera de Campeche is obtained from different Mexican bees of the genus *Melipona*; particularly from *Mel. domestica*, commonly known as *Abeja alazana*, etc. It is seen in commerce in lumps of several kilos in weight, or in oblong cakes, wrapped in maize leaves, and weighing not over 500 grams. It is opaque, yellowish, or after exposure to the air gray, internally of a much lighter yellow and fallow tint; though of a rather soft consistence, it preserves its shape, but may be moulded between the fingers and becomes adherent; it has a peculiar odor and aromatic taste, melts at 53°C., and burns with a bright and sooty flame. Ether dissolves from this wax, besides the aromatic principle, a yellow substance, which is softer, more adhesive, and more readily fusible than the wax; the residue insoluble in ether is waxy, white, hard, brittle and less readily fusible. The wax is adulterated with suet, acquiring thereby a lower melting point and greater adhesiveness; and with resinous substances, which increase the

melting point, render thin layers of the wax brittle, and are mostly soluble in alcohol. The wax is used in ointments and plasters.

Ciprés comun, *Cupressus sempervirens*, *Lin.*, and Ciprés de México, *Cupr. Benthami*, *Gordon*. The astringent cones are incorrectly called "agallas" (nutgalls) and enter into several pharmaceutical preparations.

Ciruelillo, *Bunchosia lanceolata*, *Botteri*; *Malpighiaceæ*; in the State of Vera Cruz. The root bark yields an astringent extract resembling kino.

Ciruelo agrio, *Spondias Mombin*, *Lin.*; *Terebinthaceæ*; in hot regions of Mexico. The comestible fruit has an acidulous and resinous taste.

Ciruelo de México, *Spondias purpurea*, *Lin.* The fruit is smaller than the preceding, and has a sweet, somewhat acidulous, resinous and balsamic taste; comestible.

Clavillo, *Juliana caryophyllata*, *La Llave*; *Zygophyllaceæ*; in Talpam and other localities. The leaves are stimulant.

Coclearia, *Coclearia officinalis*, *Lin.*; *Cruciferae*. In its place, *Lepidium latifolium*, *Lin.*, is used in Mexico as an antiscorbutic, the expressed juice being given in doses of 60 to 150 Gm. a day.

Coco, *Cocos nucifera*, *Lin.*; *Palmæ*; in hot districts of Mexico. The roots are used in diarrheas for their astringent properties, the pith and terminal bud for food, the flowers for their pectoral properties, and the green fruit as a hemostatic; the fermented juice furnishes a very agreeable liquor. The uses of the cocoa nut and of the oil are well known.

Colchicum alpinum, *De Cand.*; is met with in Mexico, according to Oliva, and appears to have the same properties as *Colch. autumnale*.

Colorin, *Erythrina coralloides*, *Flor. Mex. ined.*; *Leguminosæ*; in Mexico and South America. The seeds are elliptic, smooth, glossy, coral-red, with a salient longitudinal line on the back, and with a white hilum, surrounded with a black border. The analysis by Rio de la Loza showed these seeds to contain 13.35 solid and liquid fat, 0.32 resin soluble in ether, 13.47 resin soluble in alcohol, 1.61 erythrocoralloidine, an alkaloid, 5.60 albumen, 0.83 gum, 1.55 sugar, 0.42 organic acid, 15.87 starch, 7.15 moisture and 39.15 inorganic matter (and cellulose?). The seeds are very poisonous. The flowers are used for food and the white wood for bungs, and in San Luis Potosí for making various figures.

Colorin chiquito, *Rhynchosia precatória*, *H. B. K.*; Leguminosæ; in Cuernavaca and other hot districts. The seeds are reniform, somewhat compressed at the base, and from the hilum partly red and partly black. They are popularly supposed to act upon the brain, producing loss of memory; but, according to Dr. Altamirano, of Mexico, who experimented with the alcoholic extract, this belief is unfounded, although toxic principles appear to exist in these seeds.

Colorin de peees, *Piscidia Erythrina*, *Lin.*; in the State of Guerrero. The tincture of the root bark is recommended for toothache. The practice of stupefying fish by means of this plant should be prohibited.

Cominos rústicos, the fruit of a Mexican umbelliferous plant; aromatic and resembling fennel. It is referred to *Thapsia Asclepium*, *Lin.* (?); but Oliva regards as identical with it the fruit which in Jalisco is called acocote, and is derived from *Pentacripta atropurpurea*.

Contrayerba, *Dorstenia Contrayerba* and *D. Houstoni*, *Lin.*; Morcæ. The former grows in the State of Vera Cruz and other localities, and is known as barbudilla; the latter is found in Campeachy and seems to be Drake's root. Both roots are stimulant, diaphoretic and anti-periodic. The root of *Asclepias sesosa*, *Benth.*, is known as Contrayerba de Julimes, and, according to Cal, possesses the same properties and even appears to be superior to the preceding.

Copal, Goma de limon, from *Elaphrium copalliferum*, *Flor. Mex. ined.*; Rutacæ; in the hot regions of the western part of the republic. The resin is obtained by incisions made on the shrub, and is met with in commerce in semicylindrical pieces, brittle, glossy, transparent on the flat side, opaque on the convex side, and covered with earth; it has a balsamic odor and an aromatic taste, softens between the teeth like mastic, melts at 74°C., and gradually loses its transparency and becomes yellow. It has the balsamic properties of similar resins, but is not used in medicine except as a substitute for elemi in ointments.

Copalehi, the bitter bark of various trees, generally called campanillo. The bark most commonly met with is that of *Croton niveum*, *Jacquin*, s. C. *Pseudochina*, *Schiede*, which grows in Oaxaca, Plan del Rio, Tampico, Tehuantepec, between the Laguna verde and Actopan (where it is known as quina blanca, according to Schiede), in the Sierra de San Pedro, etc. Also *C. reflexifolium*, *H. B. K.*, which grows in Acapulco, Huasteca, Paso del Correo, on the river Teculata, etc., and is often confounded with the preceding species. Another

larger and more bitter bark has been referred to *Croton suberosum*, *Kunth*. According to Oliva, *Coutarea lateriflora*, *De Cand.*, *Rubiaceæ*, is known in Autlan as campanillo, and its bark is the copalchi of Guadalajara; and Jimenez states that *Hedwigia balsamifera*, *Swartz*, is called copalchi in Orizaba.

Corteza de Drimis. *Drymis mexicana*, *De Cand.*, grows in hot regions of the western slope of the Mexican cordillera; *Dr. granatensis*, *De Cand.*, in Nueva Granada. The bark is stimulant, tonic and aromatic. Dose, in powder, 1 to 8 Gm.; the infusion, 8 Gm. to a liter of water; the tincture, 10 Gm.

Costomate, *Capuli*, *Physalis Costomatl*, *Mociño et Sessé*; *Solanaceæ*; in temperate sections of Mexico. The fruit is comestible, and the leaves are diuretic.

Crameria. Besides the Peruvian *Krameria triandra*, the two Mexican species *Kr. pauciflora* and *secundiflora*, *Fl. Mex. ined.*, are mentioned as the principal sources of this drug, which, however, is not described.

Cuajilote, *Parmentiera edulis*, *De Cand.*; *Bignoniaceæ*; in Yautepec and other hot districts. According to Oliva the root is diuretic, and a decoction of the leaves is useful in external otitis.

Cuajote, *Rhus perniciosa*, *H. B. K.*; *Terebinthaceæ*; in Tepecacuilco and other hot districts. The gum resin, which exudes spontaneously, is commonly known as goma archipin. It is seen in globular masses, in tears or in irregular fragments, and varies in color between milk white, yellowish, reddish-yellow and brown, sometimes with greenish or bluish green spots; fracture glassy; spec. grav. at 18° C. 0.9383; inodorous, persistently bitter; readily emulsionized with water; when thrown in the fire, decrepitates and gives a slight smoke. Rio de la Loza found it to contain 34 gum and 44 bitter resin soluble in alcohol and ether, the remainder consisting of moisture, salts of calcium and magnesium and of extraneous matter. It is used as a purgative and diuretic (dose?) and the thick emulsion as a cement for ivory, glass, porcelain, etc.

Quasia. *Quassia amara*, *Lin.*, and *Picræna excelsa*, *Lindley*, are used, but the wood of *Rhus Metopium* is also sold under this name and is distinguished by its gray color with black spots, and by the precipitate of its aqueous infusion with sulphate of iron.

Cuautecomate, *Crescentia alata*, *H. B. K.*; *Bignoniaceæ*; in Colima, Autlan, Acapulco and other hot districts. The fruit is a round, woody, smooth berry, marked with a circular scar from the peduncle, one-

celled, many-seeded, and filled with a pulp which in the fresh state is greenish white, but after drying is black, and then resembles the pulp of cassia fistula; it contains much sugar, a notable quantity of gum, tannin and woody fibres. The pulp is recommended as an excellent remedy for allaying cough and in contusions. The leaves are astringent, and are used in diarrhœas, also for promoting the growth of the hair and preventing its falling out.

Cuauchalata, *Rajania subsamarata*, *Fl. Mex. ined.*; *Dioscoreaceæ*; in Matamoras, etc. The bark is astringent.

GLEANINGS FROM FOREIGN JOURNALS.

By J. ROBERT MOECHEL.

Purification of Potable Waters.—The process given by Prof. Almén is recommended by Prof. Th. Husemann. To 1 liter water add 3 cc. of a 5 per cent. solution of chloride of iron and also a quantity of lime-water corresponding to the hardness of the water, about 50 cc. The resulting brown precipitate is a basic iron salt and hydrated iron-oxide, which may be separated by straining or filtering through sand. 40 to 80 per cent. of the dissolved organic matters, besides the suspended organic matters, are said to be precipitated by this process.—*Schwigg. W. f. Ph.*, No. 21, 1885.

Phenol and Chloral hydrate mixed in the proportion of 17 to 10 give a liquid which is miscible with water in all proportions.—*L'Union Pharmac.*; *Leitm. Rdsch.*, No. 23, 1885.

Solutions of Iodine in Oils.—The 20 per cent. solution in castor oil is of a brown color and thick; in olive and almond oil of brownish red color and somewhat thinner. For practical purposes the solution in castor oil is of special interest as being miscible with strong alcohol and mitigating some inconveniences resulting from the use of tincture of iodine. G. Greuel recommends the following formula: Dissolve with a gentle heat iodine 10, in castor oil, and alcohol (93 per cent.) each 45.—*Archiv d. Phar.*, June, 1885.

Boric Acid is recommended by Artimini in epidemics of cholera, etc., as an antiseptic and for destroying microorganisms, and as being not injurious if taken in small doses, which may be added to food or drink—*L'Orosi*, 8, p. 44; *Archiv d. Phar.*, Mai, 1885.

The symptoms of poisoning by boric acid, according to Molodenkow,

are continual vomiting and hiccough, the appearance of red spots in the face and diminution of the number of heart-beats. In one case death followed in four days. Stimulants and morphine are recommended as antidotes.—*Journ. de Pharm. Chim.*; *Archiv.* June, 1885.

By-product in bread baking.—Experiments reported by R. K. for the recovery of the alcohol eliminated by the baking process gave the following result: On baking 3 kilos of dough 150 Gm. of distillate of 0.9801 sp. gr. were obtained, equal to spirit of 13 per cent. or 15.6 grams of alcohol. Supposing that the oven be used four times a day for baking 50 loaves of bread, weighing 2 kilos each, the liquid condensed by means of suitable arrangements during a year, would contain 730 liters of alcohol.—*Schweiz. W.f. Ph.*, No. 24, 1885.

Paraldehyde as an antidote to Strychnine is recommended by Prof. Árpád Bókai, Cervello and Dujardin-Beaumetz. Bókai also found it valuable as a counter-poison to brucine, thebaine, picrotoxin.—*Chem. Ztg.*, No. 54, 1885.

Preparation of Cocaïne.—Truphème recommends exhausting the coca leaves with ether, distilling the ether, treating the remainder with boiling water, mixing with magnesia and drying. The powder thus obtained is exhausted with amylic alcohol which yields the cocaïne somewhat yellowish; by recrystallization it is obtained colorless.—*Ann. di Chim. Med. Farm.*, Feb., 1885; *Archiv d. Phar.*, Mai, 1885.

Cotton Seed.—Sacc has communicated to the Acad. d. Sciences an analysis of the press cake of cotton seed, which contains casein 6.0, dextrin 0.2, sugar 2.0, fibrin 23.7, woody tissue 32.1, starch 9.6, greenish yellow oil 9.6, yellow wax 0.8, water 8.0, and ash 8.0. On grinding, 56.5 of yellowish meal and 40.5 of black bran were obtained. The author regards the meal as being of value in bread baking for taking the place of milk, and in the refining of sugar for removing excess of lime.—*Archiv d. Phar.*, June, 1885, p. 453.

Estimation of Casein in Milk.—Frenzel and Weil recommend diluted sulphuric acid in place of acetic acid for precipitation. In a beaker glass of 150 cc. capacity, place 60 cc. distilled water, add 20 cc. of well-shaken milk by means of a pipette and stir well. Then add 30 cc. dilute sulphuric acid (1:1000), put in a cool place for several hours, pass the supernatant liquid through a weighed filter, collect the precipitate upon the same filter, wash twice with water, and afterwards successively with 90 per cent. alcohol, absolute alcohol and ether. Dry at 110°C. to a constant weight, then incinerate and subtract the

weight of the ash from the weight of the precipitated casein.—*Ztsch. f. Physiol. Chem.*, 1885. p. 246 ; *Archiv d. Ph.*, Mai, 1885.

Preservative Salt for Meat.—Sodium chloride 8, potassium nitrate 1, salicylic acid 1 ; mix. To be rubbed on the meat, fish, etc. Before using the meat thus preserved wash repeatedly with cold water.—*Rundsch. Leit.*, 1885, p. 400.

Remedy for Toothache.—Prof. Ludovici, in "Pharm. Italian," recommends: Dry extract of opium, camphor, balsam of Peru each 0.5, mastic 1, chloroform 10. To be applied in the cavities of carious teeth.—*Ibid.*

Linctus Phosphoricus.—Mix intimately, so as to form an emulsion, phosphorus 0.01, expressed oil of almond 30.0, powdered gum arabic 15.0, sugar 15.0 and sufficient water. The dose is a teaspoonful daily.—*Ph. Ztg.*, No. 56, 1885.

Poison for Bedbugs.—Dissolve camphor 2 oz., corrosive sublimate 1 oz., and oil of turpentine 4 oz., in alcohol 1 pint.

Black Ink disappearing after a short time.—Boil nutgalls in whisky, add Roman vitriol and sal ammoniac and when cold dissolve in the liquid a little gum arabic. Writing with this ink will disappear in 24 hours.

Mucilage for Mineralogical Specimens.—Dissolve 1 part gum arabic in water, add 4 parts of sugar and 1 part of starch and boil.

Paste for Tin Cans.—Dissolve Venice turpentine in a little alcohol and incorporate with starch paste while warm. Another paste is obtained by softening glue in water, then boiling it with strong vinegar and thickening the liquid during boiling with fine wheat flour so that a paste results.

OINTMENT FOR SORE NIPPLES.—Groussin ("Éclairc. pharm.," "Lyon méd.") recommends for application to sore nipples in nursing women an ointment composed of equal parts of white sugar, oxide of zinc, gum arabic, and glycerin.—*N. Y. Med. Jour.*, June 20, 1885.

CHRYSAROBIN IN LIQUOR GUTTA-PERCHÆ.—In a note upon the treatment of ringworm of the scalp, Dr. W. T. Alexander recommends epilation and the use of a ten per cent. solution of chrysarobin in liquor gutta-perchæ, which forms a pellicle upon the surface, preventing the further extension of the disease. This treatment was very successful.—*Journal of Cutaneous and Venereal Diseases*, February, 1885 ; *Med. Times*.

PHARMACEUTICAL PREPARATIONS OF THE MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from page 376.)

Harinas emolientes, Farinæ emollientes.—Powdered flaxseed and mallow herb, equal parts.

Hidralcohol aromático, Hydralcohol aromaticus.—Digest for ten days aromatic species 100, alcohol (85 per cent.) 200, water 800, Cologne water 50, express and filter. A substitute for aromatic wine.

Inyeccion con Subnitrato de Bismuto, Injectio cum Subnitrato bismuthico.—Bismuth subnitrate 15, gum arabic 10, water 100.

Inyeccion con Tanino, Injectio cum Tannins.—Tannio 1, water 100.

Inyecciones subcutáneas.—Full instructions are given for applying hypodermic injections; the dose is stated to be for aconitine 0·5 to 2 mgm.; veratrine 0·5 to 1 mgm.; colchicine 2 mgm.; digitalin 1 to 3 mgm. The formulas direct the solutions to be made from 1 part of morphine hydrochlorate or sulphate, atropine sulphate or strychnine sulphate in 100 parts of water. The injection of quinine sulphate is made in the proportion of 1:10 with the aid of a little sulphuric acid. The injection of ergot is made from the aqueous extract, by precipitating with strong alcohol, decolorizing the filtrate by means of animal charcoal, evaporating the alcohol, and adding water to make the weight equal to that of the ergot used; the solution is preserved by dissolving in 100 gm. of it 0·15 gm. of salicylic acid.

Jabon animal, animal soap, is the soda soap of ox-marrow, and Jabon medicinal the soda soap of sesame oil; the latter is intended for internal use in the dose of 0·5 to 4·0 gm.

The syrups with the exception of those containing alcohol or acidulous juices, have at 15°C. a density ranging from 1·261 to 1·321. The following differ more or less from the syrups ordered by other authorities.

Jarabe atemperante (temperante), Syrupus temperans.—Equal parts of the syrups of red poppy petals and of lemon juice.

Jarabe balsámico, Syrupus de Balsamo tolutano.—Dissolve tolu 60 in alcohol 50, and impregnate with this solution cotton 17; then mix

intimately with cotton 33, loosen the cotton by picking, and expose to the air until the alcohol has been evaporated; now digest for two hours in water 500, express and again digest in the same quantity of water; mix the infusions, filter after cooling, and in every 100 parts of the filtrate dissolve 190 parts of sugar.

The syrups of benzoin and of storax are prepared in the same manner.

Jarabe de Belladonna, *Syrupus de Belladonnâ* is one-half the strength of that of the French Codex and is made with tincture of belladonna 75 and simple syrup 1925.

Jarabe de Acónito is four times stronger than the French preparation, and is made by mixing tincture of fresh aconite leaves 100 and simple syrup 900.

Jarabe de Cuautecomate, *Syrupus de fructibus Crescentiæ alatæ*.—Pulp of the fruit 100, water 300; macerate for twelve hours with frequent agitation, express, strain and boil with sugar 500 until the boiling syrup has a density of 30° B.

Jarabe de extracto de Opio, *Syrupus cum extracte Opii*, contains in 1,000 parts, 2 parts of extract of opium, and is just four times stronger than the Jarabe diacodion.

The fruit syrups of quince, pomegranate, lemon, mulberry, blackberry, pineapple and of *Bromelia Pinguin* are prepared by dissolving sugar 1750 in 1,000 parts of the clarified juice.

Jarabe de Narceina, *Syrupus cum Narceinâ*—Narceine 1, water (containing 0.6 gm. of hydrochloric acid sp. gr. 1.16) 100, distilled water 250, sugar 650; dissolve.

Jarabe depurativo de Chavert, *Syrupus depurans ex Chavert*.—Boil sarsaparilla 180 and China root 60 with water 4,000, suspending in the liquid powdered black antimony 60, enclosed in a piece of linen; when the liquid has been reduced to 1,500 macerate it with orris root 60, round aristolochia root 60 and senna 120, strain, add sugar 2,000 and honey 2,000, form a syrup and mix with the tincture prepared from jalap 30, sassafras bark 60 and alcohol (60 per cent.) 375.

Leche para niños, *Potio Rosarum composita*.—Rose water 120, magnesia 2, powdered soap 0.006, syrup of orange peel 15; mix. As an antacid for babies in doses of a spoonful.

Leche virginal, *Tinctura de Benzoino composita*.—Benzoin 120, Ceylon cinnamon 30, cloves 30, mace 30, alcohol (80 per cent.) 2,000; macerate for 8 days, add balsam of Peru 30, again macerate for 8 days

and filter. Used as a cosmetic, a little of the tincture added to water forming a milky mixture.

The fixed oil directed for the various liniments is sesame oil. The following may be mentioned :

Linimento de Cloral, Linimentum cum Chloralo.—Powdered chloral hydrate 6, sesame oil 30 ; dissolve with trituration and by the aid of a moderate heat.

Linimento de Jabon (de Goulard), Linimentum Saponis ex Goulard.—White animal soap 500, water 2,000 ; dissolve by means of a gentle heat, stir well while cooling and incorporate with it a mixture made of sesame oil 250 and subacetate of lead 120.

Oleosacaruros, Oleosaccharureta, are made from 1 part of volatile oil and 72 parts of sugar.

Opiata de Copaiba compuesta, Opiatum Copaibæ compositum.—Mix equal weights of copaiba, powdered catechu and powdered cubeb.

Pastillas de Cuahtecomate, Pastilli de fructibus Crescentiæ alatæ.—Aqueous extract of the pulp of Crescentia alata 50, gum arabic 50, sugar 200. Each lozenge is to weigh 1 gm.

Pildoras de Boncio, Pilulæ ex Bontius.—Barbadoes aloes, gamboge and ammoniac, of each 10 gm., white vinegar 60 gm. ; heat gently, strain the liquid, evaporate to a pilular consistence and form into 150 pills.

Pildoras pacificas, Pilulæ Opii compositæ s. pacificæ.—Powdered opium 30, nutmeg 6, saffron 6, benzoic acid 4, oil of fennel 0.006, oil of nutmeg 0.006, honey 20 ; make into 1,344 pills, each of which contains approximately 0.022 gm. of opium.

Polvero de contrayerba compuesto, Pulvis Dorsteniæ compositus.—Powdered contrayerba root 60, root of Dictamnus albus 60, mistletoe 60, calcium phosphate 104, hydrated ferric oxide 3 ; mix. Recommended in various nervous affections ; dose 0.6 to 4.0 gm.

Polvero de Jalapa compuesto, Pulvis Jalapæ compositus.—Jalap root 34, jalap resin 4, scammony 4, potassium nitrate 12, potassium sulphate 12, oil of anise 0.013 ; mix. Dose 1 to 4 gm.

Polvero de Rosa compuesto, Pulvis Rosæ compositus.—Rose petals 125, linaloe 45, cinnamon 15, cloves 15 ; mix. Used as a tonic application to ulcers.

Polvero dentrífico de Comoto, Dentifricium ex Comoto.—Cream of tartar 25, cochineal 50 ; mix the powders, moisten the mixture with

sufficient water to form a paste, dry, reduce to a fine powder and mix with powdered cloves 6 and calcium phosphate 150.

Polvo galactóforo, Pulvis Foeniculi compositus.—Powdered fennel 125, sugar 125, calcium phosphate 375, origanum 125, hydrated oxide of iron 5; mix. Dose 4 to 15 gm.

Pomada de Cloral, Pomatum cum Chloralo.—Chloral hydrate 6, lard 30; dissolve in a wide mouth vial with the aid of heat.

Pomada de Sulfato de quinina, Pomatum cum Sulfate quinico.—Quinine sulphate 3, tartaric acid 2, water 4; dissolve and mix with benzoinated lard 30.

Pomada de Toronjil, Pomatum cum oleo volatile Cedronellæ mexicanæ.—Oil of cedronella 15, lard 500. As a cosmetic for the hair.

DISINFECTANTS.

It will be seen by the correspondence of the *Medical News*, of Philadelphia, of June 20th, page 704, that the International Sanitary Conference at Rome, Italy, has decided to confine itself to the subject of the prevention of cholera until that be disposed of, and then, if there be time and a disposition to discuss them, other diseases may be taken up.

A committee of seven was appointed to consider the subject of disinfection, with Dr. Sternberg, the U. S. delegate, named first; but upon his proposition, Dr. Koch was made Chairman.

After several protracted sessions the committee made a long report, which was adopted by the Conference by a vote of 20 to 1.

The Conference, therefore, recommends, as means of disinfection against cholera:

1. Steam at a temperature of 100° C. (212° F.).
2. Carbolic acid. Chloride of lime.
3. Aëration.

Carbolic acid and chloride of lime are to be used in aqueous solution:

Weak solutions.—Carbolic acid, 2 per cent.; chloride of lime, 1 per cent.

Strong solutions.—Carbolic acid, 5 per cent.; chloride of lime, 4 per cent.

These means of disinfection will be applied as follows:

I. For the disinfection of person the weak solutions should be employed.

II. For the disinfection of clothing, bedding (*des linges, des habits, des couvertures*) and other articles of this kind:

(a) destruction ; (b) steam passed through the articles for one hour ; (c) boiling for thirty minutes ; (d) immersion for twenty-four hours in one of the weak disinfecting solutions ; (e) aëration for three or four weeks, but only in case the other means recommended are inapplicable.

Articles of leather, such as trunks, boots, etc., should be either destroyed or washed several times with one of the weak disinfecting solutions.

III. Vomited matters and the dejections of the sick should be mixed with one of the strong disinfecting solutions, in quantity at least equal to the amount of material to be disinfected. Linen, clothing, bedding, etc., recently soiled by the dejections of the sick, which cannot be immediately subjected to the action of steam, should be at once immersed in one of the strong disinfecting solutions, and left for four hours.

IV. The dead should be enveloped in a sheet saturated with one of the strong disinfecting solutions, without previous washing of the body, and at once placed in a coffin.

V. Disinfection of merchandise and of the mails is unnecessary (steam under pressure is the only reliable agent for the disinfection of rags—*les chiffons en gros*).

VI. When cases of cholera occur upon a vessel at sea, the locality where the case occurs should be disinfected. The floors and walls of the cabin, or other locality, should be washed at least twice with one of the weak disinfecting solutions, and then exposed freely to fresh air.

In the case of objects of considerable value, which have not been in immediate contact with the sick, and which would be seriously injured by a rigorous disinfection, the physician on board may determine what measures are necessary to protect the sanitary interests of the vessel.

The bilge-water should be pumped out, and replaced by sea-water, at least twice at each disinfection of a vessel.

The *closets* should be well washed with one of the strong disinfecting solutions at least twice a day.

VII. If the drinking-water is open to suspicion, it should be boiled before it is used, and the boiling should be repeated, if it is not used, within twenty-four hours.

All suspected food should be destroyed, or at least recently cooked.

VIII. Hospitals should be disinfected by washing the floors and walls with one of the weak disinfecting solutions, by a subsequent free ventilation and cleansing, and finally by repainting. The wards to be disinfected should, as far as possible, be isolated from those in use.

The latrines should be disinfected at least twice a day by pouring into them the strong disinfecting solutions in quantity at least equal to the amount of the dejections received since the last disinfection.

IX. The clothing worn by physicians and attendants should remain in the hospital, and should be regularly disinfected.

Physicians and attendants should use the weak disinfecting solutions for washing their hands, etc.

It will be noticed by this quotation from the correspondent of the *Medical News*, that so far as cholera is concerned, the Conference does

not agree with the conclusions of Dr. Sternberg's committee here, in omitting carbolic acid as not being a true disinfectant, but, on the contrary, places it first in rank, as taking precedence in value over chlorinated lime, and this appears to have been done upon the experience of Dr. Koch. This delegate objected to recommending corrosive sublimate, for two reasons: First, because it was too dangerous for general use; and, second, "because, its disinfecting action was, to some extent, interfered with by the fact that it entered into combination with albuminous material, and thus failed to come in contact with germs enclosed in albuminous masses."

Dr. Koch's first objection appears to be more sound than his second one, since it is highly probable that all germicides act by combination with the albuminous material of the infective matter.

Only two chemical disinfectants were recommended, not because there were none others trustworthy, but because it was sufficient to recommend two of those most generally useful. Indeed, Dr. Koch seems to have considered carbolic acid alone sufficient, but in deference to the work of the Committee on Disinfectants of The American Public Health Association, made no objection to including chloride of lime with carbolic acid in the recommendation, upon the representations of Dr. Sternberg.

The aqueous solutions of carbolic acid here recommended are very easily made from either the officinal crystallized carbolic acid, or from good impure carbolic acid or coal-tar creasote. When made from the latter they will be better disinfectants, but the odor is much more disagreeable.

To make the solutions from the crystallized acid, or Phenol, the one pound bottle of crystals should be melted by setting it in warm water. A fluidounce of water should then be added and the contents be shaken. This will serve to keep it fluid. Then the solution is made as wanted. For the 2 p.c. solution 2 measures to 98 measures of water will be sufficiently accurate, and for the 5 p.c. solution 5 measures to 95 of warm water. The solution of this proportion in cold water is a little tedious, but by the use of warm water it dissolves at once.

For continuous use about infectious cases it is only necessary to keep the strong solution, and a half gallon bottle can be conveniently made at a time by putting about $3\frac{1}{4}$ fluidounces of the fluid acid in the bottle, filling with warm water, and shaking well. This may be repeated as

often as required, and a pound bottle of crystals, or of the impure acid will thus make about $2\frac{1}{4}$ gallons of the strong solution.

When the weak solution is wanted it may be made from the strong by adding to each measure of it $1\frac{1}{2}$ measures of water. That is, one bottle of the strong solution will make two and a half bottles of the weak.

This weak solution is quite benumbing to the skin if applied for any considerable length of time.—*Ephemeris*, July, 1885, p. 829.

NOTE ON CAMPHOR MOTIONS.

BY P. CASAMAJOR.

On the 4th of October, 1877, I read a paper "On the Motions of Camphor on the Surface of Water," before the American Chemical Society, in which I described experiments, which had led me to the conclusion that these motions were due to electricity.

The extraordinary motions which give an appearance of life to pieces of camphor, swimming on the surface of water, are not to be seen at all times. Very often camphor will remain motionless, while at other times the pieces gyrate with great animation. One of the earliest observers of these singular motions, Romien (1748), came to the conclusion that they were due to electricity, while subsequent investigators, among whom may be counted the great Volta, have generally decided that there is no connection between electricity and the motion of camphor on water.

I was led to believe that camphor motions were due to electricity by the results of experiments, of which I will give a brief account.

When pieces of camphor are thrown on water, they may remain torpid or they may gyrate with every appearance of life. In the latter case, the motions may be instantly arrested by dipping a finger in the water on which camphor moves. If we have pieces of camphor lying quietly on water, they may be made to move by dipping into the water a rod of either glass, sealing wax or vulcanite, electrified by friction. After every immersion the glass is to be dried by wiping with a dry cloth or a piece of bibulous paper; and, before every immersion, the rod is electrified by rubbing with a piece of silk or flannel. After one or more immersions of the electrified rod, the camphor motions invariably start, and by a few additional immersions they increase in

intensity. The fact that these motions could be started by means of an electrified rod was a new one. Those who had decided that camphor motions were not due to electricity were not acquainted with it, and I was led to believe by this fact, and by others which I gave at the time, that camphor motions were electrical phenomena. There was, however, something unsatisfactory in this method of applying electricity to the water on which pieces of camphor floated, but, at that time, no other method occurred to me. Afterwards the whole subject slipped from my mind, but, quite recently, the following experiment has suggested itself, which seems to show that camphor motions are not due to the state of electrical tension of the liquid on which pieces of camphor float.

The experiment was performed in a glass dish about two inches deep, and of five inches diameter. This was filled with water up to within an inch of the top. The bottom of the dish and the sides, up to within an inch of the top, were covered in tin foil. A metallic wire dipped in the water of the dish, with one end out of the water, but having no connections with the outside lining of tin foil.

This glass dish was equivalent of a Leyden jar, which could be charged with electricity from the plate of an electrophorus by touching the wire dipping into the water with this plate, laying a finger at the same time on the outside armature.

A few pieces of camphor were placed upon the water in the dish, and these were reduced to immobility by dipping a finger in the water. After this the water in the dish was charged with electricity by repeatedly placing the plate of an electrophorus in contact with the wire dipping into the water, while the outside armature was touched with a finger.

There was no effect produced on the pieces of camphor floating on the water of the dish. These remained motionless, not exhibiting the slightest tremor. There could be no doubt that the water surface was in a greater state of electrical tension in this experiment than when the water is electrified by dipping an excited rod in it, for, by placing one hand on the outside armature of the dish, and slowly approaching the water surface with a finger of the other hand, a perceptible spark was obtained.

There seems to be a discrepancy between the results to be obtained in these two classes of experiments.

By dipping an electrified rod successively in water the camphor motions always take place, while, when we electrify by applying the

plate of an electrophorus to the water in the dish, as described, not the least tremor can be perceived. As these results were obtained over and over again, there cannot be any doubt as to the difference of the effects in the two modes of operating.

The conclusion that may be drawn is that camphor motions are not caused by electricity. In the case of an electrified rod, dipped successively in water, I am inclined to the opinion that electricity acts indirectly by removing physical impurities from the surface of the water, as shown by the following experiment :

Take a glass of water, and on its surface place a few pieces of camphor. If these are inclined to move, they may be stopped by dipping a finger in the water. Then blow a cloud of lycopodium powder over the surface of the water, so as to cover this surface uniformly with the powder. If now an electrified rod is dipped repeatedly in the water, wiping it dry after every immersion, and, rubbing it with a piece of flannel before dipping in the water again, the result will be that the pieces of camphor will move as if gifted with life. It will be noticed at the same time that the surface of the water will be almost entirely free from lycopodium, as the powder has been gradually removed by each successive immersion of the electrified rod, which attracts lycopodium like all other light bodies. If now we suppose that films of oily matter are removed in the same way by an electrified rod, we may conceive how electricity can act indirectly in removing impurities from the surface of the water.

There would remain to explain why films of oily matter or other impurities act as a check on camphor motions while a physically clean water surface is a favorable condition in producing these motions. Towards the solution of these questions I will venture the following explanation, which may serve as the base of further researches.

It is a well ascertained fact relating to camphor motions, that when these motions take place the camphor dissolves in water more quickly than when the camphor is at rest. I think that a connection exists between camphor motions and the three following facts : 1st, that camphor dissolves in water quite easily at times ; 2d, that its density allows it to float on water ; and 3d, that the solution has a density slightly different from that of water. I am not prepared at present to develop these ideas, which would require further experiments to establish.

I will confine myself to the well ascertained fact that a piece of camphor wears away much faster when in motion than when at rest.

This being established, it appears more than probable that if a piece of camphor is perfectly free from oily matter it will dissolve in water more readily than if protected by a greasy film. The slightest film of this nature, in contact with camphor, becomes a saturated oily solution of camphor, and if any excess exists, over what will cover the camphor, the film will extend over the surface of the water.

When things are in this condition, if an electrified rod is dipped several times in the water, every immersion will remove a portion of oily film from the surface, until finally the film on each piece of camphor becomes so thin that the water reaches the pieces of camphor, and these immediately becomes gifted with motion.—*Jour. Am. Chem. Soc.*, 1885, p. 13.

THE CULTIVATION OF THE STAR ANISE TREE AND THE PREPARATION OF THE OIL IN ANNAM.¹

The star anise, or badiane, called by the Annamites "bac-giai-qua" or "qua-hoi," is the fruit of a tall tree that is cultivated in the mountainous regions of Annam, upon the slopes covered with earth. The natives affirm that it is nowhere met with in the mountains in the wild state. At the village of Na-nam, in the mandarin route, twelve kilometres from Lang-son it has been ascertained by inspection that the seedlings and young trees are the objects of attention by the Annamites, who surround them with bamboos; also that the larger trees are planted in a regular manner.

The "qua-hoi," the trunk of which is as straight as that of the poplar, bears branches resembling those of the eucalyptus. It is met with everywhere in the mountains around Ha-long, Dong-dang, Van-quan and Pho-vi, which are the principal centres of culture and production. The oil is prepared at Lang-son, Ki-lun, Dong-dang and Ha-long, industrial centres of manufacture.

During ten years, the "bac-giai-qua" grows very slowly. At the end of that time it attains a height of about three metres. Up to that time it produces very little, scarcely yielding more than one or two Annamite kilograms (1,200 grams). From its tenth year its size and its production increase rapidly up to thirty or forty years, at which age the tree commences to fall off and die. A tree of ten to fifteen centimetres diameter yields an average of twenty Annamite kilograms

¹ From the *Petit Moniteur de la Pharmacie*, July.

of fruit; a full-sized tree, with a diameter of forty to fifty centimetres, gives two hundred kilograms. The fruit is sold whilst green to the manufacturers of the oil at the price of four tiens the Annamite kilogram.

The Annamites sow the seed of the "*bac-giai-qu*a" in manured soil. The young plants issue from the soil after about twenty or thirty days, and in two or three years they attain a height of twenty or thirty centimetres. They are then transplanted and pricked out at a distance of five or six metres from each other, but always upon the slopes free from stones and never at the bottom of a ravine.

The tree bears a small yellow and white flower in the first or second month of the Annamite year and fruit in the sixth to the ninth month, but it yields fruit only every two years. The collection of the fruit is made by hand. The cultivation is not subject to any impost. The fruit is purchased either directly in the villages, or in the country markets, at a half ligature the Annamite kilogram.

The manufacture of the oil was subject to a tax that was collected by the "*tuam-phu*," who was at the same time the farmer of star anise for the province of Langson. The tax varied according to the extent of the operation; it was three ligatures for a large distillation of ten kilograms of fruit, and one ligature and a half for a distillation of three or four kilograms. This tax was paid for every distillation and authority to distil had to be renewed each time. The only existing apparatus is of the dimensions suited for one or other of these two quantities.

The oil is the product of a distillation conducted as follows: Into a first recipient, which is an iron pan about seventy-five centimetres in diameter, are placed ten kilograms of star anise and water, which quantity nearly fills it. A second iron pan, pierced with a circular opening about twenty-five to thirty centimetres in circumference, is placed upon the first, bottom upwards, so as to form a cover. Over the opening in this pan is placed an earthen vessel, having three small orifices in the lower part, which allow the access of the vapor into this vessel. These orifices are covered, on the inside of the recipient, by small ear-shaped hoods that have for their object to throw the vapor upon the side of the vessel. Lastly, this earthen vessel is covered by an iron pan which performs the part of refrigerant, and into which a continuous current of cold water is made to pass by means of a bamboo pipe, from a vat placed near the apparatus. The joints of the first

two iron pans are luted with a mastic, that of the earthen vessel with the refrigerant by means of rag bandages. The vapor reaching the earthen vessel is condensed when it strikes upon the bottom of the pan holding the cold water, and falls into a small circular trough running round the bottom of the vessel, from which it escapes through a small pipe. The small pipe opens out into a bamboo which conducts the products of distillation into a closed tinned vessel full of water, where the oil, rising to the top, drives out a corresponding quantity of water.

A distillation lasts two days and the yield from ten Annamite kilograms of star anise is two and a half decilitres of oil. The residue of the distillation is thrown away. A single manufacturer, and there are many, would distil 150 to 180 Annamite kilograms of oil yearly.

The oil is enclosed in tinned recipients and sold in China at Luongchau. Before the French occupation of Hanoi and Bac-ninh, a part of the products went by these two places into Tonquin, but since then the Chinese dealers have remained the masters of the market.—*Phar. Jour. and Trans.*, July 25, 1885, p. 91.

PRICKLY PEAR IN AMERICA.

In some recently published Consular reports of the United States the following interesting paragraph on the nopal, or prickly pear (*Opuntia cochinillifera*) occurs: "The plant abounds in the whole territory of Mexico, Texas, New Mexico, Arizona, and California, and extends much further north. It has flat oval leaves, about six inches long and nearly half an inch thick, covered by long sharp thorns, and bears a fruit of a purple color resembling a pear, filled with numerous small seeds. The plant grows from three to six feet high. Its fruit is eaten freely by cattle, and the leaves, after having been burnt in a fire to get rid of the thorns, are thrown by the cartmen in place of fodder to their oxen by means of a long sharp-pointed stick, especially when on a road where there is no grass. It also makes an excellent hedge, and once planted will last for ever. There is another species of nopal called *nopal de castilla*, which has no thorns, and which is cultivated for the sake of its fruit. This nopal has much larger leaves than the wild species, and grows to the height of ten and twenty feet, and the fruit is much larger. Of this species there are a great many

different kinds, each having its distinct name. They are of different colors—green, red, yellow, white, and purple. The fruit is delicious, and in the interior of Mexico forms one of the principal means of sustenance for the inhabitants. From the purple tuna a liquid is made called *colonche*, and a sort of sweet cheese (*queso de tuna*). There is a small red tuna growing wild in the mountains near to Zacatecas, called *cardona*, which is highly prized on account of its fine flavor and digestible qualities, and several cartloads of which are sold daily in Zacatecas. They are sold at six cents for four dozen. Besides serving for food for men and beasts, its leaves form the food of the cochineal insect.”—*Phar. Jour. and Trans.*, June 27, 1885; from *The Gardener's Chronicle*, June 20.

NOTE BY THE EDITOR.—The Mexican Pharmacopœia describes a product of these plants under the designation of *goma de nopal*, also improperly called *tragacanto del país*. It is produced by different Mexican species of *Opuntia*, such as *O. Tuna*, *Miller*, *O. rosea*, *De Cand.*, *O. Hernandezii*, *De C.*, and others, the plants being called *nochtli* in Mexico, *pari* in Tarasco, *raquette* by the French and *nopal* by the English and Spaniards. The gum is in vermicular or roundish pieces, horn-like, yellowish white, translucent or opaque and insipid. Immersed in water it swells, becomes white, does not form a mucilage and leaves a farinaceous residue. With iodine it becomes blackish blue. The microscope reveals groups of thin needle-shaped crystals of calcium oxalate, by the presence of which this gum is easily recognized if used for adulterating tragacanth. It is employed for similar purposes as the latter.

Nopalillo, *Opuntia Nopalillo*, *Karwins*, is a Mexican cactus, of which the root is employed in the form of infusion, in dysentery, diarrhœa, hæmoptysis and metrorrhagia.

REMEDIES FOR CORNS.—For corns oleate of copper spread as a plaster is recommended in “*St. Louis Med. Jour.*” This has probably a similar effect as the *ceratum æruginis* of German pharmacy which contains 5 per cent. of verdigris, while some old formulas directed as high as 15 per cent. See also May number p. 241.

LOTION FOR FETID PERSPIRATION OF THE FEET.—Martin (“*Bull. g. n. de thérap.*”) recommends the following solution :

Permanganate of potassium	15 grains.
Thymol.....	30 “
Distilled water.....	30 ounces.

Inner soles made of filtering-paper, cotton, or some like material, are to be moistened with the solution, and new ones should be used every morning.—*N. Y. Med. Jour.*, May 23, 1885.

DETECTION OF COLOCYNTHEIN, ELATERIN, AND BRYONIN.

BY E. JOHANSSON.

Colocynthin when heated with dilute sulphuric acid yields colocynthein, elaterin and bryonin.

Colocynthin is soluble in water and alcohol; it gives an orange color changing to red with concentrated sulphuric acid, a cherry-red coloration with sulphuric acid containing molybdic acid, a blood-red coloration turning blue at the edge with sulphuric and vanadic acids, a yellow coloration with alcohol and sulphuric acid, distinguishing it from solanine and solanidine, and a yellow coloration with sulphuric and selenic acids; moistened with phenol and a drop of sulphuric acid, it gives a blood-red coloration changing to orange.

Colocynthein is not as soluble in water as colocynthin, it is only sparingly soluble in light petroleum, but easily in benzene. With molybdic and sulphuric acids, it remains at first unchanged, but finally becomes a dirty cherry-red. With vanadic and sulphuric acids, its reactions resemble those of colocynthin. Colocynthin and colocynthein may be separated by shaking the acid solution with benzene which dissolves the colocynthein, and afterwards with ethyl acetate which dissolves the colocynthin.

Elaterin is insoluble in water; it is sparingly soluble in cold, but easily in boiling alcohol; it crystallizes in colorless, shining, six-sided plates. With concentrated sulphuric acid, it gives a pale yellow coloration, becoming red at the edges after some time, and finally cherry-red. Molybdic and sulphuric acids give a fugitive green color. Phenol and sulphuric acid give a momentary red coloration. Vanadic and sulphuric acids give a fine blue, changing to a bright green color. Selenic and sulphuric acids give a red color not so intense as that produced by concentrated sulphuric acid alone. Alcohol and sulphuric acid give on warming only a faint yellow color. When evaporated on the water-bath, and then treated with sulphuric acid, a violet-red coloration is obtained. The elaterin reactions are slow, and with the exception of the characteristic vanadic and sulphuric acids test, unsatisfactory.

Bryonin, in its reactions, resembles colocynthin and elaterin, and is readily soluble in water and alcohol. Selenic and sulphuric acids give a dirty cherry-red, and vanadic and sulphuric acids a blue-violet color.—*Jour. Chem. Soc.*, May, 1885, p. 606; *Zeit. Anal. Chem.*, vol. 24, 154–157.

DETECTION OF BERBERINE, HYDRASTINE AND
OXYACANTHINE.

BY L. V. HIRSCHHAUSEN.

Berberine gives with phosphomolybdic or phosphotungstic acid a yellow amorphous precipitate, with potassio-mercuric iodide the precipitate is greenish-yellow, with potassio-bismuthic iodide orange-red, with potassio-cadmium iodide bright yellow. The precipitates formed with platonic chloride, auric chloride, mercuric chloride, picric acid, and potassic bromide are all of a yellow color, and are easily obtained with 0.01 mgrm. of the alkaloid. Potassium dichromate gives a yellow amorphous flocculent precipitate with 0.02 mgrm. An alcoholic solution containing 0.01 mgrm. berberine sulphate, gives with a solution of iodine in potassium iodide an immediate crystalline precipitate of a green color if the reagent is added gradually. Potassium ferrocyanide precipitates a salt of the alkaloid in yellow needles. Concentrated pure sulphuric acid, when added to a small quantity of the dry salt, gives a yellow coloration darkening to olive-green and finally disappearing. Molybdic and sulphuric acids give an immediate yellow color, changing through dark-brown to violet-brown. Vanadic and sulphuric acids give a fine violet, and selenic and sulphuric acids a bright yellow color with 0.01 mgrm. of the salt. Chlorine water gives a blood-red coloration with 1 mgrm. of berberine sulphate, but if the salt be first dissolved in a few drops of a 33 per cent. solution of hydrochloric acid, the color is produced with 0.01 mgrm. of the salt. A crystal of potassic nitrate and the dry salt when moistened with concentrated sulphuric acid, give a brown-red passing to a fine orange-yellow. If potassium dichromate be substituted for the nitrate, the color is more of a violet tint at first, and finally assumes a brownish-yellow hue. Phosphoric acid gives a yellow color. With sugar and sulphuric acid, a yellow coloration, changing through green to black is produced. Bromine-water precipitates an orange-yellow bromide which rapidly loses its color. Berberine is only sparingly soluble in chloroform, and not at all in petroleum, ether, or benzene.

Hydrastine gives with phosphomolybdic acid a bright lemon-yellow precipitate; with phosphotungstic acid, potassio-cadmium iodide, or potassio-mercuric iodide, white precipitates; and with potassio-bismuthic iodide and potassium dichromate, orange precipitates. With 0.1 mgrm.

of the alkaloid a solution of iodo-potassium iodide gives a deep brown flocculent precipitate. Vanadio-sulphuric acid gives a beautiful rose-red color which slowly disappears. A crystal of potassium dichromate and sulphuric acid give a golden-yellow color, changing to brown and green. Chlorine-water gives no coloration, even in the presence of hydrochloric acid. Bromine-water added to a solution of hydrastine in strong sulphuric acid gives an immediate orange precipitate. Hydrastine is insoluble in light petroleum, but the greater part dissolves in benzene.

Oxyacanthine gives white precipitates with potassio-mercuric iodide, tannic acid, and potassio-cadmium iodide; orange precipitates with picric acid or potassio-bismuthic iodide, and a deep brown precipitate with iodo-potassium iodide. Molybdic and sulphuric acids give an immediate violet coloration, changing to yellowish-green at the edges.

Oxyacanthine is not extracted from acid solutions by light petroleum or benzene, and only sparingly by chloroform.—*Jour. Chem. Soc.*, May, 1885, p. 606; *Zeit. Anal. Chem.*, vol. 24, 157–163.

DETECTION OF SANGUINARINE AND CHELIDONINE.

BY A. V. KÜGELGEN.

Concentrated sulphuric acid gives with 0.1 mgrm. of sanguinarine a blue-violet coloration, changing after several hours to a dirty green. Sulphuric and molybdic acids give a violet color with a tinge of red resembling, but somewhat lighter than, the corresponding morphine reaction; after an hour, the color becomes brown and eventually green. Vanadium sulphate gives a bluish-violet color, which turns bluish-black on standing. Selenic and sulphuric acids do not give so intense a violet color as is produced when sulphuric acid alone is added. 0.02 mgrm. of the alkaloid in a few drops of dilute sulphuric acid (1 of acid to 50 of water) gives precipitates with tannin, bromo-potassium bromide, phosphotungstic acid, iodo-potassium iodide, and phosphomolybdic acid; and a turbidity with picric acid, potassio-mercuric iodide, potassio-cadmium iodide, potassio-bismuthic iodide, and gold chloride. Sanguinarine is not extracted from its acid solutions by light petroleum, and only sparingly by benzene and chloroform.

Chelidonine.—0.5 mgrm. of this alkaloid gives with sulphuric acid at first a pale-green color, changing to brown edged with red or violet. The violet color is only observed in strong solutions. Sulphuric and

molybdic acids give a green color, changing to blue, brown and black. Selenic and sulphuric acids, after a time, give a pale-green, which changes on warming, to a red-brown. Sulphuric acid and potassium dichromate give similar reactions. Vanadic sulphate gives an intense emerald-green coloration, which turns to a bright blue, changing to a dark green. Potassium nitrate and sulphuric acid give a green, changing to a blue, and finally becomes fawn-colored (in small quantities, the color is steel-blue). Bromine and sulphuric acid give a red-brown with green streaks. Sugar and sulphuric acid give a rose-violet color, changing to cherry-red and blue-violet. Chelidonium is not extracted from an acid solution by light petroleum, only slightly by benzene, but better by chloroform.—*Jour. Chem. Soc.*, May, 1885, p. 608; *Zeit. Anal. Chem.*, vol. 24, 165–166.

NITROGENOUS SUBSTANCES INSOLUBLE IN GASTRIC JUICE.

BY A. STUTZER.

In almost all vegetables there are found three groups of nitrogenous substances: one, soluble in water, and represented by asparagin; the second, comprising albumin, dissolved by the hydrochloric acid pepsin of the stomach, and chemically distinguished from amides by forming *insoluble* compounds with copper hydroxide in neutral solutions; the third group is composed of all those nitrogenous substances which are not soluble in water or in acid pepsin. The author undertook the examination of the latter group, and as the results of experiments on the living animal would probably be rendered doubtful by the presence of mucin and other nitrogenous matters in the excreta, due to the transformation of tissue, he decided on employing artificial digestion. The substance used for preliminary experiments, was commercial coconut cake, largely used as cattle fodder. This was treated with acid pepsin solution, and afterwards with variously prepared extracts, of pancreas, in order to remove the nitrogen as much as possible. The results showed that the alkaline pancreatic extract had less effect on protein matters than the acid pepsin, although in some cases the results were very close. The examination of other animal secretions suggested itself to the author. Hoppe-Seyler denies the power of intestinal secretions to dissolve albumin, and even should it be proved here-

after that there are ferments in the organism which have the power of digesting albumin, it must be remembered that such ferments have a less powerful action than either the gastric or pancreatic juices, and that food materials which are unaffected by these two secretions are probably valueless as nourishment.

To prepare the extract of pancreas, the author took the pancreas of an ox (400 grams), freed as much as possible from fat, exposed it freely to the air for 24 hours, rubbed it down finely with sand, covered it with dilute glycerol (1 litre glycerol and 1 litre water), and after 4—6 days pressed and filtered. When used, this extract must always be made alkaline by the addition of soda.

Some of the experiments were made to determine if soda alone was able to dissolve nitrogenous compounds. Two samples of finely ground barley straw were digested with artificial gastric juice, after which there remained in the undissolved portion a mean of 0.206 per cent. nitrogen. After further digestion with $\frac{1}{2}$ per cent. soda solution at 40° for several hours there remained nitrogen undissolved 0.105 per cent. Experiments with leaves of grass and palm-nut kernels yielded similar results. Whether the soda acts simply as a solvent or causes a true decomposition of the substances acted on, is a question the author cannot answer.

A quantity of palm-nut cake was first treated with freshly prepared acid pepsin solution, after which it contained an average of 0.461 per cent. nitrogen. Portions were then treated with 100 cc. of pancreas extract to 2 grams of residue (a proportion preserved in all the experiments), $\frac{1}{2}$ and 1 per cent. soda solutions being used to give an alkaline reaction. The results were negative, the differences being within the limits of experimental error. Other observations convince the author that $\frac{1}{2}$ to 1 per cent. soda solution without any ferment act as solvents equally well as when pancreas ferment is present; this he explains by the organic matter from the pancreatic glands diluting the soda and gradually diminishing its solvent powers.

A mixture of lucerne and grass hay which left a residue after digestion of 0.293 per cent. nitrogen, after treatment with pancreas solution containing 1 per cent. soda, left 0.213 per cent.; with $\frac{1}{2}$ per cent. soda, 0.271 per cent. In the former case 27 per cent., in the latter but 7 per cent. of the difficultly soluble nitrogen was dissolved. Similar experiments with the following substances show the percentages dissolved by the pancreas solutions:

Cocoa powder, 26 per cent.; dry flesh meal, 24 per cent.; ship's biscuits, 27 per cent.—*Jour. Chem. Soc.*, July, 1885, p. 827; *Zeit. physiol. Chem.*, vol. 9, 211–221.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Convolvulin and Jalapin. These resins after having been taken internally, could not be detected by Bernatzic (1862) in the urine, and in the fæces only after very large doses had been given. Köhler and Zwicke (1869) succeeded in proving their presence in the contents of the stomach and intestines. In a series of experiments with cats, made in Dorpat by Dr. J. Müller (Thesis, 1885) the compounds named or their derivatives were shown to be absent from the fæces, urine, kidneys and bladder; the reactions were quite distinct with blood, stomach, jejunum and ileum, faint with duodenum and the large intestines, and very faint with heart, lungs and spleen. A cat having been killed five hours after taking 0.5 gm. jalapin showed a relatively distinct reaction in the blood; but the different organs gave either a very faint reaction or none.

The process for separating the resins was selected after a series of experiments as follows: the mass was macerated for a day with 3 times its weight of 96 per cent. alcohol, the filtrate concentrated, acidulated, agitated with petroleum benzin for the removal of impurities, and afterwards with chloroform, on the evaporation of which the resin was left behind. Blood treated in the same manner, leaves a residue giving the same reaction, but after treating this residue with absolute alcohol, filtering and evaporating, the residue left from blood does not show the reaction, except in the presence of the resins named. The test used for the color reaction was concentrated sulphuric acid, about 10 drops, which dissolves the resins; the solutions on the careful addition of water show a red color within a few minutes, which, however disappears rapidly; but if the solution be allowed to absorb moisture from the atmosphere, the reaction takes place slowly in about an hour and continues for a longer time.

Analysis of Brazilian Coffee. Fifteen authentic samples were analyzed in Dragendorff's laboratory. The moisture was determined from the coarse powder at 105° C.; all the other determinations were calculated for the dry substance. The ash was obtained from the unbroken seeds; for estimating the phosphoric acid, the ash was dissolved in warm diluted hydrochloric acid, the solution mixed with sodium acetate, the ferric phosphate filtered off, and the phosphoric acid in the

filtrate determined by titration with uranium acetate. The fat was extracted from the fine powder by petroleum benzin, and this exhausted powder used for determining the caffeine, which had to be freed from traces of fat by benzin. Nitrogen was estimated by the method of Dumas, as modified by Zullkowsky and Arzberger; after deducting the nitrogen of the caffeine, the remainder multiplied by 6, gave the albuminoids. For the determination of tannin a modification of Löwenthal's method was used and the permanganate solution standardized with pure coffeotannic acid. The cellulose was found according to F. Schulze by successive treatment with nitric acid sp. gr. 1.16, water, diluted ammonia, alcohol and ether. The following results were obtained :

	Moisture.	Ash.	Phosphoric Acid.	Nitrogen, total.	Albuminoids.	Caffeine.	Fixed Oil.	Tannin.	Cellulose.
Mean.....	11.16	3.54	.402	4.14	22.95	1.09	13.50	6.50	11.59
Highest.....	12.72	4.24	.490	4.46	24.78	1.22	16.48	7.60	13.03
Lowest.....	8.66	2.92	.280	3.63	19.86	0.99	11.26	5.46	8.68

—*Phar. Zeitschr. Russl.*, 1885.

Cupreol and *Cinchol* are isomeric compounds of the formula $C_{20}H_{34}O$, which were isolated by O. Hesse, the former from cuprea bark, the latter from different cinchona barks; in addition to cinchol the bark of *C. Ledgeriana* contains also the isomeric *quebrachol*. These three compounds as well as *phytosterin*, isolated by Hesse from Calabar beans and from peas, belong to the class of cholesterins. The above new compounds were prepared from the coarsely powdered barks (20 to 25 kilos being used) by exhausting with petroleum benzin, treating the extract with boiling alcohol, cooling to separate greenish resin, concentrating between 40° and 60° C. until resin began to separate, then evaporating the clear liquid spontaneously, and separating the oily matter by means of bibulous paper or by saponification with potassa. From 0.002 to 0.003 per cent. of cupreol was obtained from cuprea bark, and it was also found besides cinchol, in the bark of *Cinch. officinalis* and *C. Calisaya* var. *Schubkrafft*.

Cupreol crystallizes from alcohol or glacial acetic acid in colorless

satiny scales, which on exposure become dull glossy. It is insoluble in water and alkalies, freely soluble in chloroform, ether and hot alcohol, and less freely soluble in petroleum benzin and cold alcohol. Its chloroformic solution like the solutions of quebrachol, cholesterin and phytosterin, on being agitated with sulphuric acid sp. gr. 1.76 acquires a blood red color. The scales contain 5.93 per cent. (1 mol.) of water, which they begin to lose at 15° C. Cupreol melts at 140° C., volatilizes at a higher temperature, crystallizes from petroleum benzin or ether in anhydrous long needles, and when heated with acetic or propionic anhydrides, yields the corresponding crystalline esters.

Cinchol crystallizes with 1 H₂O in needle-shaped scales or in broad lamina, melts at 139° C., is somewhat less strongly lævogyrate, and otherwise resembles cupreol.

The author examined also Kerner's cinchocerotin (see "Am. Jour. Phar.," 1883, p. 357), from which cinchol and acetyl cinchol were prepared, differing from the preceding merely in having a slightly lower melting point.—*Liebig's Annalen*, vol. 228, p. 288–298.

Myoconine and lycaconitine, two amorphous alkaloids have been obtained by Dragendorff and Spohn ("Phar. Zeitsch. f. Russl.," 1884, No. 20–24) and were shown to yield, with soda, the decomposition products lycoconine and acolectine, discovered by Hübschmann in 1865; also a nitrogenated acid *lycoconic acid*. The rhizome and rootlets of *Aconitum Lycoctonum* were treated by Duquesnel's process for aconitine.

Lycaconitine melts at about 112° C., is freely soluble in ether, alcohol, chloroform, benzol, and acidulated water, has a bitter taste, and yields amorphous salts, the solutions of which are precipitated by the various alkaloidal group reagents. Sulphuric acid dissolves it with a brownish cherry-red color; sulphuric acid and sugar, color reddish brown or black-brown; sulphuric acid and bromine color transiently violet, then brown, and more or less deep violet colorations are produced by Froehde's reagent, vanadio-sulphuric acid, selenio-sulphuric acid and warm syrupy phosphoric acid.

From experiments on different animals made by Dr. Jacobowsky (Thesis, Dorpat, 1884), it appears that this alkaloid is an energetic poison, resembling curare in its action, is constipating, is partly excreted in the urine and feces, and partly decomposed into compounds which are apparently not poisonous.

Myoconine melts near 144° C., has a bitter taste, is sparingly soluble

in ether, petroleum benzin and water and freely soluble in alcohol, chloroform, benzol and acidulated water. The salts are amorphous, and their solutions give precipitates with the alkaloidal group-reagents. Sulphuric acid or sugar and sulphuric acid impart a brownish color with a faint reddish tint; warm syrupy phosphoric acid dissolves the alkaloid with a dingy violet color; vanadio-sulphuric acid and Froehde's reagent give no characteristic color reactions.

Experiments made on different animals by Dr. Salmonowitz (Thesis, Dorpat, 1885) show the poisonous action of myoctonine to resemble that of curare; the alkaloid is rapidly resorbed and eliminated through the urine, to some extent also with the feces.

VARIETIES.

USE OF POTASSIUM BICHROMATE.—Güntz ("Memorabil.") speaks highly of this drug in cases of syphilis which resist treatment with mercury, and in which the constitution has been badly broken down by the disease. Not only is there a complete absence of general disturbance after the use of chromium, but, according to the writer, the cure is rapid and complete. The daily amount which he employs is half a grain of potassium bichromate, divided into four doses. Güntz denies that headache ever followed the use of the drug.—*N. Y. Med. Jour.*, June 6, 1885.

PERMANGANATE OF POTASSIUM IN AMENORRHEA.—Dr. E. J. Doering, of Chicago, says, on this subject: (1) Permanganate of potassium in doses of from two to four grains, is an efficient emmenagogue, if administered for a period of not less than two weeks. (2) Its administration in doses large enough to be effectual is accompanied by severe pain, which frequently necessitates a discontinuance of the remedy, and hence impairs its value as an emmenagogue. (3) The most efficient method of administering the drug is in capsules, taken midway between meals, and followed by large draughts of some pure mineral water, like silurian.—*Chic. Med. Jour. and Examiner*.

SUBCUTANEOUS INJECTIONS OF CYANIDE OF MERCURY IN SYPHILIS.—

Prochorow ("Wratsch;" "Ctrlbl. f. Chir.") reports eighty cases of syphilis treated with subcutaneous injections of a one-per-cent. solution of the cyanide. The average number of injections required before the disappearance of active symptoms was twenty. Not more than twenty-five or thirty drops were injected at a time. Only two abscesses resulted from nearly twenty-seven hundred insertions.—*N. Y. Med. Jour.*, June 13, 1885.

ANTIDOTE FOR IODOFORM.—Dr. Behring found tablespoonful hourly doses of a twenty-per-cent solution of bicarbonate of potassium to act as a prompt antidote in iodoform poisoning.—*Louisville Medical News*.

EDITORIAL DEPARTMENT.

CREDIT. The paper entitled "Analysis of Ilex Cassine" which was published in our last number page 389, was read before the American Chemical Society, April 3, 1885, and appeared in the April number of the Journal of that Society, from which it was transferred to our pages.

REDUCED RAILROAD FARES have been secured over most railways for the meeting of the American Pharmaceutical Association to be held at Pittsburg, September 8. Members residing east of Pittsburg and Erie will have to procure, prior to September 4, certificates from Mr. T. J. Macmahon, 142 Sixth Avenue, New York; paying full fare to Pittsburg, they will be returned at one-third fare from Pittsburg, or if returning via Washington or Baltimore, the return tickets will be sold from these cities.

Similar arrangements have also been made for the Western members, who may procure the necessary certificates from either one of the following gentlemen: George W. Sloan, Indianapolis; Lucius Lybrand, Noblesville, Indiana; J. W. Tomfohrde, Twenty-second and Benton streets, St. Louis; E. H. Sargent, 125 State street, Chicago, or T. H. Patterson, 3640 Cottage Grove avenue, Chicago.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Fourteenth Annual Report of the Alumni Association of the College of Pharmacy of the City of New York, 1885. Published by the Association. Pp. 94.

The pamphlet contains the minutes of the various meetings, the papers read, account of the commencement exercises, rolls of graduates and members, etc.

Contributions from the Department of Pharmacy of the University of Wisconsin. Madison, Wisconsin, 1885. 8vo, pp. 61.

The papers comprise several essays by Professor Power, and others by students on investigations made by them under the guidance of Professor Power. We shall refer to several of these papers in another place.

Jahresbericht über die Fortschritte auf dem Gesamtgebiete der Agricultur-Chemie. Neue Folge, vi (Das Jahr 1883). Herausgegeben von Dr. A. Hilger, Professor der angewandten Chemie an der Universität Erlangen. Berlin: Paul Parey, 1884. 8vo, pp. 613.

Annual report on the progress upon the entire domain of Agricultural Chemistry. New Series, vol. vi. For the year 1883. Price, in paper cover, 22 marks.

The volume before us is the twenty-sixth of the series and has been prepared by a number of collaborators and edited by Prof. Hilger. The vast amount of material is arranged under the following general headings, each

one having been assigned to a special reporter: Soil, water, atmosphere, the plant (ashes, germination, assimilation, external influences, cultivation, etc.), plant diseases, manure, phytochemistry (including proximate analyses), analytical methods, animals (including food, fodder, excretions and secretions, nourishment, etc.), and accessory agricultural pursuits (milk, butter, cheese, starch and sugars, fermentation, beer, alcohol, oenology, etc.). The subject, it will be observed, is thoroughly covered; the literature has been exhaustively consulted and the abstracts have been made with good judgment, keeping in view their practical utility and importance.

The Australasian Journal of Pharmacy. Published under the direction of the Pharmaceutical Society of Australasia. Melbourne. Svo.

The first number of this Journal, issued last June, contains upon 22 pages a large amount of information relating to pharmacy in the colonies of Australia. It is intended to take the place of the "Australasian Chemist and Druggist," the publication of which will be discontinued at the end of the present year. The American agents are S. M. Pettengill & Co., 37 Park Row, New York.

Proceedings of the Sixth Annual Meeting of the Kansas Pharmaceutical Association, held at Lawrence, June 10th, 1885. Pp. 51.

Proceedings of the Fourth Annual Meeting of the Massachusetts State Pharmaceutical Association, held in Maplewood Hall, Pittsfield, June 3 and 4, 1885. Pp. 214.

Brief accounts of these meetings will be found on pages 361 and 362 of our July number.

Table of Metric Weights and Measures. Published by Robert J. Crocker, New York.

In a note to the Editor the publisher requests to notice "my card for the conversion, etc." The table is said to be a reprint from the "Druggists' Circular;" but it is merely a copy of the one calculated by us for the "American Journal of Pharmacy," and first published in the volume for 1877, page 92; subsequently also in the National Dispensatory, 1st edition, p. 1561, and 2d edition, p. 1648. The Druggists' Circular, June, 1877, *did* give proper credit to the source from which the information was taken, and a like courtesy might be expected from the present publisher.

Chemical Problems. By Dr. Karl Stammer. Translated from the second German edition, with explanations and answers, by W. S. Hoskinson, A.M., Wittenberg College, Springfield, O. Philadelphia: P. Blakiston, Son & Co., 1885. Pp. 111. Price 75 cents.

Stoichiometrical calculations by students are frequently not practiced to the extent commensurate with their practical importance. The little work before us is an extensive collection of problems on this subject, systematically arranged by elements, the gradation of the problems being from very simple to quite complicated ones. Part second contains problems on approximate ratios, on temperature and atmospheric pressure, and such of a

mixed nature, and finally the answers to the problems, thus affording the students the opportunity of private practice in such calculations. The work deserves to be extensively used by students in chemistry and pharmacy.

Practical and Analytical Chemistry, being a complete course in chemical analysis. By Henry Trimble, Ph.G., Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Philadelphia: P. Blakiston, Son & Co., 1885. 8vo, pp. 94.

This little work is divided into three parts, of which part I, headed "Practical Chemistry," is designed for the instruction in the preparation of gases and salts. Of both classes of preparations typical cases have been selected, so that their number is limited, but may be obviously readily increased under the guidance of an instructor, the main object of this portion of the book being to familiarize the student with the construction of apparatus and with the various chemical manipulations. The second part is devoted to "Qualitative Analysis," the inorganic bases being arranged in groups as usual, and in each case the characteristic tests are given, which at the end of each group are summarized in such a manner that the results are indicated as obtained with all metals of the group by each reagent; directions for separating the different metals of the group, and pointing out the necessary precautions are not omitted. The bases are followed by the inorganic and a goodly number of the more important organic acids, and by the important alkaloids and neutral principles. The third part treats of "Quantitative Analysis," in two sections, viz, gravimetric and volumetric estimation.

The arrangement of the work is very convenient, so that the facts may be readily grasped by the student. Intended for beginners, the author has judiciously avoided superfluity and prolixity, and presents a volume, by the aid of which a fair knowledge of chemical analysis may be gained, and which will be found useful also by the more experienced student. Embellished with a number of good engravings, and printed in clear type and upon good paper, the little volume presents also a handsome appearance combined with usefulness.

Report of the Board of Managers of the Pennsylvania Hospital to the Contributors, made Fifth month 4th, 1885. Pp. 72.

Valedictory delivered at the Fourth Annual Commencement of the Medico-Chirurgical College of Philadelphia, April 2d, 1885. By A. S. Gerhard, M.D., Professor of Pathology and Medical Jurisprudence. Pp. 20.

ERGOT IN CONSTIPATION.—Two cases of constipation are reported by Dr. Granzio (*Allg. Med. Zeitung*), which were caused by, or, at least, followed the abuse of purgatives. Three doses of ten grains each were given at intervals of two hours, and were followed by a copious evacuation. A second stool occurred spontaneously the next day, and after the administration of ergot in small doses for a few days a definite cure was obtained. *Med. and Surg. Reporter*, April 25, 1885.

OBITUARY.

PROFESSOR DR. HERMANN VON FEHLING was born in Lübeck, North Germany, June 9th, 1812, and died in Stuttgart, July 1, 1885. After finishing his school education, he entered a pharmacy as apprentice and subsequently studied chemistry under Gmelin, at Heidelberg, where he graduated. He continued his studies under Liebig, at Giessen, where, in 1838, he discovered paraldehyde, and made researches on benzoic acid, fulminic acid and other compounds. In 1839 he received a call as Professor of Chemistry and director of the chemical laboratory connected with the Polytechnic School at Stuttgart, where he has since resided, and was in addition to his educational duties, entrusted with labors in other fields as one of the inspectors of pharmacies, as director of a laboratory for technological research, as a member of the medical commission (board of health), etc. The researches in theoretical chemistry were gradually and under the influence of his duties, superseded by such of a more practical nature, notably on analytical methods, and it is one of these—the estimation of sugar by means of an alkaline copper solution in the presence of alkali tartrates—which has made his name well known throughout the civilized world. As a member of the German pharmacopœia commission he naturally exerted considerable influence on the character of this work as far as the chemical properties and the analytical investigations of the admitted preparations are concerned. Aside from the official documents, the papers on his theoretical and analytical researches and a German translation of Payen's industrial chemistry, Fehling's literary labors were prominently connected with the celebrated *Handwörterbuch* (Dictionary) of Chemistry, commenced by Liebig, Poggendorff and Wöhler in 1842, for some time edited by Kolbe and subsequently by Fehling, under whose supervision the first edition was finished in 1864, and the second, still unfinished, edition commenced in 1871.

DR. THEODOR GEISELER died July 6, 1885, in Königsberg, where he was born September 9, 1799. In 1814 he became an apprentice in a Berlin pharmacy, and after clerking for some years in various cities, continued his studies in Berlin where he passed the State's examination in 1824. He succeeded his father in business in his native city and joining the North German Apothecaries' Society, soon became a prominent member and one of its directors. His numerous contributions to pharmaceutical literature were mostly published in the "*Archiv der Pharmacie*" previous to 1860 and comprise, besides papers on ethical and educational subjects, investigations on galenic preparations, on the valuation of medicinal articles, and on chemicals, such as phosphoric acid, chlorine water, potassium tartrate, ammonium acetate, zinc cyanide, ferrous sulphate, ferrous iodide, lead subacetate, bismuth subnitrate, salts of mercury and others. In 1833 the University of Giessen conferred upon him the title of doctor of philosophy, the subject of his dissertation being amygdalin and bitter almond water; and a number of scientific societies honored him by the election as honorary or corresponding member.

PROFESSOR DR. FRANCIS XAVIER LANDERER was born in Bavaria in the year 1809 and studied philosophy and medicine at the University of Munich. When Otho I was elected King of Greece, Landerer was called to Athens and attached to the school of pharmacy. In 1834 a Commission was appointed for preparing a Greek pharmacopœia. The Commission consisted of Prof. John Bauro, Prof. Landerer and Jos. Sartorius, apothecary to the court, and the pharmacopœia, an octavo volume of 540 pages, was published in the Latin and new Greek languages in 1837. In the same year the University of Athens was founded and Landerer was appointed professor of physics, chemistry and pharmacy, but in 1843 he had to vacate the chair in consequence of a revolution which resulted in the dismissal of the Bavarian officials. No suitable person being found to fill his place, he was reappointed by special act in 1845. In the mean time he occupied also the chair of chemical technology in the Polytechnic Institute without receiving any compensation for the labor, and when his former pupil, St. Krinos, was appointed director of this institute, Landerer was obliged to withdraw from the chair which he had filled gratuitously for 25 years. After the dethronement of Otho in 1862 and the accession of Georg I to the throne, Landerer opened a pharmacy in Athens and soon after resigned also his professorship in the University. In 1831 he commenced to write for Buchner's Repertorium, his communications referring mostly to the origin and uses of Oriental remedies. More recently and up to within a short time of his death he contributed similar brief notes to other Journals, many being on the same subjects which years ago were discussed in the Repertorium. Of late years Landerer's health failed and he was mostly confined to his house or to his bed until his sufferings were terminated by his death, which took place at Athens, July 19 (old style July 7), 1885, at the age of 76 years. The deceased was honorary president of the Panhellenic pharmaceutical society, and an honorary or corresponding member of a number of scientific societies, among them of the American Pharmaceutical Association, and of the Philadelphia College of Pharmacy. Four daughters, of whom three are married, survive the deceased.

PROFESSOR HENRI MILNE-EDWARDS died at Paris in August, 1885, having nearly completed his 85th year. He was born in Bruges, Belgium, October 23, 1800, and studied medicine in Paris where he graduated in 1823. He wrote a work on *Materia Medica* in 1832 and a hospital formulary in 1840; but he is best known and acquired fame by his researches in comparative anatomy, zoology and in natural history, chiefly on the lower animals such as the Radiata, Mollusca, Articulata, Crustacea, etc. He was first appointed professor of natural history to the Lyceum of Henry IV, and afterwards to the Museum of the Faculty of Sciences. In 1838 he was elected a member of the Academie des Sciences to succeed Cuvier; in 1854 he became a member of the Academie de Médecine, and in 1862 he succeeded Saint-Hilaire as professor of zoology; he was also honorary member of a number of scientific societies.



ERYTHROXYLON COCA, Lam.

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NOTES ON THE ALKALOIDS OF COCA LEAVES.

BY A. B. LYONS, M.D.

A year ago there were probably not a dozen places in the United States where cocaine could have been bought, and, except in an experimental way, not a grain of the alkaloid had been manufactured in this country. To-day there is not a second-rate drug store in any one of our cities which does not keep on hand a small supply of the article, and manufacturers have been obliged again and again to increase their capacity to produce it, so active has been the demand.

As long as the alkaloid was only to be found in collections of rare chemicals, or as an item in the long list of articles which for the sake of completeness the largest dealers in chemical specialties were obliged to have in stock, no especial interest attached to this particular alkaloid, and accordingly we find most of the text-books entirely silent with regard to its properties; many of them do not even mention its existence.

Now that it has come into every day use, however, it is important that its chemical reactions should be as well known as those of quinine or caffeine, since it is now liable to come under observation in medico-legal investigations. It is also desirable that the physical properties of the cocaine salts should be familiar, so that purchasers may be on their guard against substitutions or adulterations.

There is yet much to be learned in regard to the alkaloids of coca leaves. It is not improbable that there may be several distinct alkaloids which have not yet been described. It is very certain that much of the cocaine in the market is a mixture of several apparently distinct substances, but cocaine is itself so unstable a compound that it is not easy in the present state of our knowledge to affirm that some of these substances are not allotropic modifications of cocaine itself.

Coca leaves when they reach this country contain, so far as assays have yet been able to show, not more than 0.8 per cent. of cocaine.

The writer has examined leaves which yielded no more than 0.15 per cent., and of this scarcely any was capable of forming crystallizable salts. Freshly imported leaves of a recent crop contain generally 0.65 to 0.8 per cent. of extractible alkaloid, but of this not more than one-half generally consists of crystallizable alkaloid. In manufacturing operations the yield of alkaloid is much below what assays show to be present. It is doubtful indeed whether any method of assay yet devised extracts nearly all the alkaloid. A good sample of coca leaves yields a tincture which when titrated with Mayer's reagent gives an apparent alkaloidal strength much higher than the assay indicates, but it is altogether possible that the precipitate consists in part of compounds not alkaloidal.

The assay process adopted by the writer has been recently described in detail;¹ it consists in treating the leaves, in fine powder, with about eight times their weight of a mixture of stronger ether 95 volumes, spirit of ammonia 5 volumes, and washing out the alkaloid after 24 hours' maceration from an aliquot portion of the solution, first into acidulated water, then from alkaline solution into ether, evaporating and weighing. Some assays have been reported from Bolivia which seem to show that the leaves when freshly gathered contain a much larger proportion of alkaloid than after transportation to this country. This confirms the statement that has been often made, that in Peru and Bolivia coca leaves are believed to deteriorate very rapidly, so that when more than six months old they are not considered fit for use. It is even stated that the coca chewers find that the leaves when they arrive at the coast, in the usual mode of transportation, are less active than at the beginning of their journey. In a climate as damp as that of the coca-producing regions it is probably next to impossible to dry the leaves properly before packing, and it is easy to understand how under these conditions they suffer even from so short a journey.

Some packages of coca shipped from Lima apparently in good condition, at the end of their voyage were found by the writer much heated—temperature in the centre of the package 110°F.—and evidently greatly deteriorated. These leaves contained nearly 18 per cent. of moisture; had they been really dry, *i. e.*, so as to contain 10 per cent. or less of moisture, they would probably have lost nothing in the transportation.

¹ "Chicago Pharmacist," September, 1885.

The alkaloid obtained from leaves that have deteriorated is always more or less dark colored, and contains a small proportion only that is capable of taking on the crystalline form. From good leaves the alkaloid obtained in assays is nearly or quite colorless, and is left in the form of a crystalline mass on evaporation at a low temperature of the ether.

Crude cocaine has a characteristic tobacco-like odor, which suggests the idea that some portions of the product have become split up so as to reveal the pyridine constituent of the base. This odor, however, does not disappear when the alkaloid is neutralized. Solutions of the crude product in alcohol have generally a brownish color, which is deep in proportion to the amount of impurity present. From hot alcoholic solutions, 1:1, a large portion of the alkaloid separates on cooling in the form of distinct prismatic crystals. The mother-liquor by spontaneous evaporation yields another crop of less perfect crystals, which may, however, be obtained by repeated recrystallization nearly or quite colorless. After the cocaine has all crystallized out there remains a dark-colored syrupy liquid, which consists partly of alkaloid apparently identical in chemical and physiological characters with cocaine, but which does not itself crystallize, and does not form crystallizable salts. For this uncrystallizable alkaloid the names cocaicine and cocainidine have been proposed. It appears to bear to cocaine a relation similar to that of chinoidin to quinine, or of invert sugar to sucrose, but no ultimate analysis has as yet been made of it, and our knowledge of it is very incomplete.

Besides this there is often present a feebly basic, extremely bitter substance, which possibly may be ecgonine, of which accounts accessible to me are very meagre. The malodorous constituent already mentioned seems not to have the character of an alkaloid, for its odor remains unchanged after neutralization with an acid. It is easily separated from the crystallizable alkaloid by repeated crystallizations, and this appears to be the only way of obtaining a pure product.

Pure cocaine should exhibit the following characters: colorless distinct crystals (Fig. 1), or a crystalline white powder, without odor, at first seeming to be tasteless, but as it dissolves developing a slightly bitter taste, and producing numbness of the tongue; wholly soluble in ether, soluble also in alcohol, chloroform, benzol, petroleum ether, bisulphide of carbon, in "petrolina" oil and melted petrolatum, and

in the fixed and volatile oils; nearly insoluble in water.¹ It combines with acids, completely neutralizing them and forming salts which are generally easily crystallizable.

The salt of cocaine most employed is the hydrochlorate. Although crystallizing easily, it is often offered in the form of an amorphous powder, and such a product is not of necessity impure. The salt, however, should be nearly white, and wholly free from odor, and should show no disposition to absorb moisture from the air. The microscopic appearance of the crystallized pure salt is shown in Fig. 3, B, drawn from nature. It should dissolve easily and completely in water, yielding a colorless solution, neutral or very faintly acid to litmus paper, and having a saline, not a strongly bitter taste. A solution containing one grain to the fluidounce will produce a sensation of numbness in the mouth and throat if a few drops of it are swallowed. When treated with Froehde's reagent (sulphomolybdic acid) the salt

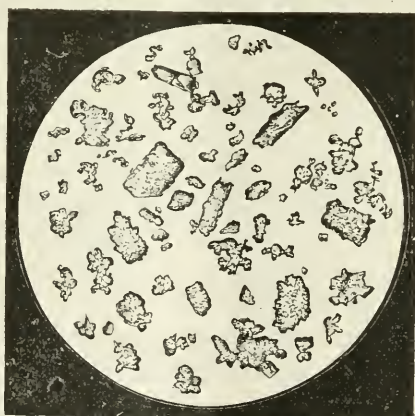


FIG. 1.—Cocaine alkaloid, commercial product crystallized from alcohol. X 50 diameters.

should produce no immediate coloration; impure products generally give a reddish brown color, more or less rapidly fading. In a few cases a green color has been observed to develop subsequently.

The salt dissolves in less than its own weight of water. It is also freely soluble in alcohol, less readily in absolute alcohol and in chloroform, and is practically insoluble in ether, in petroleum ether and in

¹Authorities state that cocaine requires for solution 704 parts of water. The crystallized alkaloid is much less soluble than this, since it crystallizes from a solution containing 1:1,500. It would probably require of cold water for solution not less than 2,000 times its weight.

fixed and volatile oils. The aqueous solutions yield by spontaneous evaporation acicular crystals, which after drying over sulphuric acid seem to be anhydrous. Crystals obtained from alcoholic solutions are certainly anhydrous. Their form is that of rhombic plates, but the crystals are generally very imperfectly formed. (Fig. 2.)

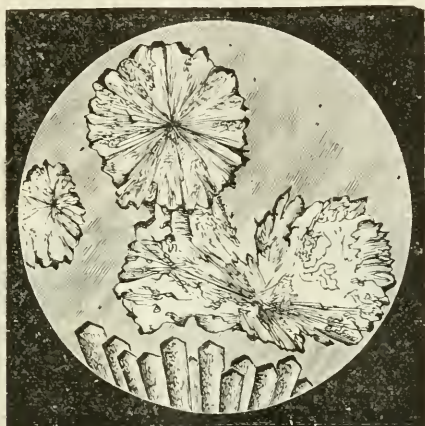


FIG. 2.—Cocaine muriate. Crystals obtained by spontaneous evaporation of a drop of saturated aqueous solution. X 100 diameters.

Cocaine hydrobromate is a salt less employed than the hydrochlorate, but deserving to be better known. It crystallizes readily from aqueous solutions in slender transparent prisms (Fig. 4), which are permanent in the air. They contain two molecules (8.57 per cent.) of water of crystallization. The purity of the salt is at once manifest in its crystalline appearance, and there is no reason why it should not always be offered in the form of distinct crystals. It contains of course a smaller proportion of cocaine than the muriate (72.2 per cent. in the former, 89.25 per cent. in the latter), so that to produce the same effect a larger quantity will be required.

Cocaine citrate has been employed to a limited extent in dentistry, but has no points of superiority over the muriate. It does not easily assume the crystalline form, and owing to its hygroscopic nature it is very troublesome to dispense. It can be formed into pellets for dentists' use without the addition of any excipient; but by the use of a small amount of excipient the hydrochlorate can be made easily to answer the same purpose.

Cocaine combines with oleic acid to form a readily crystallizable salt, which is much employed in the form of a solution in excess of oleic acid or in any bland oil. Where an oil is used it will be found necessary to employ in connection with it a certain proportion of oleic acid, or crystals of the cocaine oleate will separate from the solution in cold weather.

A more desirable preparation, perhaps, is a solution in a pure mineral oil of the alkaloid itself, and although there still exists a prejudice in the minds of some physicians against the use of mineral oils in liniments, ointments, etc., experience seems to show that this preparation at least is as active as a solution of the oleate of the same strength in oleic acid or in a vegetable oil.



FIG. 3 A.—Cocaine alkaloid, crystals formed by adding ammonia to aqueous solution, 1 : 1000, of cocaine muriate. X 75 diameters.

B. Cocaine muriate crystals, commercial. X 50 diameters.

Cocaine combines with boric acid to form a crystallizable salt rather sparingly soluble in water, which contains no more than 55 per cent. of the alkaloid, one molecule of base requiring apparently four of boric acid for neutralization.

There seems to be no reason why this salt should be used in preference to the hydrochlorate or hydrobromate, and in fact it is little employed.

With sulphuric acid cocaine forms a salt which crystallizes easily in short six-sided prisms; of the remaining salts the oxalate may be mentioned as one which crystallizes easily, and which may be obtained

from an ethereal solution of the alkaloid by the addition of an ethereal solution of oxalic acid.

The behavior of the salts of cocaine to reagents presents little that is distinctive. So far as my experiments have extended, it does not give any color reactions of any importance. Its most characteristic peculiarity is the facility with which its molecule is split up, with formation of benzoic acid. If treated with an alcoholic solution of sodium or potassium hydrate, the alkaloid is very rapidly destroyed, and benzoic ether, recognized by its odor, is immediately formed. After a short time the solution is found to contain abundance of benzoic acid, but hardly a trace of alkaloid. If ecgonine is formed in the first stage of the reaction it must be afterwards in turn destroyed,

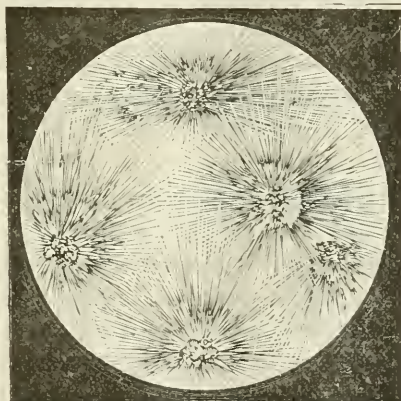


FIG. 4.—Cocaine hydrobromate. Crystals formed by spontaneous evaporation of aqueous solution. X 50 diameters.

or else its reactions are not those of an ordinary alkaloid. Lime and ammonia act more slowly, but both gradually effect a similar result. This action of alkalis was recently pointed out by H. MacLagan (*"American Druggist,"* February, 1885). It had previously been well known that cocaine is split by the action of strong hydrochloric acid into benzoic acid, ecgonine and methylic alcohol by a reaction which Lössen formulates thus:



G. Calmels and E. Gussin have recently showed that baryta effects the same decomposition when heated for some time at 120°C. in a sealed tube with a solution of cocaine hydrochlorate. According to

these authorities, ecgonine has the characters rather of an acid than of an alkaloid. It is neutral in reaction and combines with alkalies to form compounds which have a faintly alkaline reaction and are very soluble in water and in alcohol. It forms, however, double salts with platinum and gold chlorides, but, unlike those of most alkaloids, these are readily soluble in water. By destructive distillation of the barium compound of ecgonine these authors obtained an isotropine, $C_8H_{15}NO$, which they regard as methoxyethyltetrahydropyridine, ecgonine being methoxyethyltetrahydropyridine-carboxylic acid, while cocaine is methylbenzo-methoxyethyl-tetrahydropyridine-carboxylate, an extremely plausible and lucid view, no doubt, but one which we must be content to leave to the theorists to discuss.

For the identification of cocaine the organoleptic properties of the alkaloid are of the first importance. The benumbing effect upon the tongue is unlike that of any other substance, and is produced by a very minute quantity of the substance. The effect on the mucous membrane of the eye is equally striking. One drop of a 4 per cent. solution will blanch the entire conjunctiva, an effect which is most strikingly manifested on the vascular inner surface of the lids. The anæsthetic effect is also very noticeable, even from this small quantity of the agent, and may be fully developed by repeating the application two or three times at intervals of two minutes. More or less dilatation of the pupil generally follows such an application, but this does not appear to be a constant effect. It is questioned by some, indeed, whether cocaine itself dilates the pupil at all, this effect being attributed to hygrine, or some other accompanying alkaloid. I am inclined to think the effect is really produced by cocaine; at least I have not succeeded in producing a salt which does not exhibit this action. It is certainly safe to say that it is not due to contamination with hygrine, which could not be present in the purified product.

Reactions of the various impurities liable to occur in cocaine have not as yet been sufficiently studied. One curious one I may mention, although the explanation of it is not yet found. This is the development of an intense green color by the action of acids. When the impure alkaloid is treated with hydrochloric acid to produce a salt the solution assumes this color as long as the acid remains in excess. As the solution becomes neutral the green color fades, passing finally to a brownish shade, with separation of a flocculent brown precipitate. The color suggests the idea that there may be present some chlorophyll

derivative. Other acids besides the hydrochloric develop it under similar conditions.

The behavior of solutions of pure cocaine muriate with the common reagents has been studied by the writer with the following results:

Mayer's reagent is capable of detecting very minute quantities of the alkaloid. A single drop of a solution containing one part of the salt in 12,500 parts of water yields with this reagent a distinct precipitate. A faint cloud is produced in a solution, 1:100,000; in one of half this strength it is barely discernible, a single drop of the solution placed on a mirror being employed in this as in the other tests mentioned.

In solutions containing one part of alkaloid in 500, one Cc. of Mayer's reagent corresponds with ten milligrams of alkaloid; in solutions of double this strength, one Cc. of reagent consumed indicates 12.5 milligrams of alkaloid, while in solutions twice as strong again (1:125) one Cc. of the reagent indicates 15 milligrams of cocaine. In estimating the strength of a solution volumetrically, therefore, by this reagent, it is necessary to obtain in a preliminary experiment a rough approximation to the result, and then, having diluted the solution so that it shall contain nearly one part of alkaloid in 500, to make a second, more careful experiment; but this is true, to a greater or less degree, of all titrations with Mayer's reagent.

A solution of iodine in iodide of potassium produces in a solution containing 1:7,500 of cocaine hydrochlorate a pinkish precipitate; in stronger solutions the precipitate appears brown. A faint yellowish cloud is produced in solution 1:200,000; barely perceptible in a solution 1:400,000.

Phosphomolybdic acid produces a faint turbidity in a solution 1:50,000, and a distinct precipitate in one 1:12,500.

Tannin produces a faint cloud in solutions 1:25,000 (neutral); a distinct precipitate in solutions 1:12,500.

Picric acid produces in strong solutions a yellow precipitate, which assumes crystalline form. In solutions 1:400 the precipitate is thrown down at once, appearing under the microscope in sheaf-like forms. In solutions 1:1,000 a few crystals may be found, appearing after the lapse of some minutes.

Potassium bichromate precipitates only strong solutions (1:25), the precipitate being amorphous or yellow.

Mercuric chloride produces a white amorphous precipitate in solutions 1:100, none in solutions of half that strength.

Caustic alkalies precipitate the alkaloid in crystalline form from moderately dilute solutions; from stronger ones in amorphous state, but soon assuming crystalline form. Thus, in a solution 1:500 ammonia produces at once a white precipitate, which soon changes to stellate groups of crystals. In a solution 1:1,000 the crystals appear in a few minutes; in a solution 1:1,500 the crystals develop only after some time.

Caustic soda and potash produce very similar effects, the crystals perhaps forming more promptly. Where ammonia is the precipitant the crystals often arrange themselves in complicated growths, tufts of acicular crystals springing from the nodes of jointed stems formed by the larger primary crystals. (See Fig. 3, A.)

The carbonates and bicarbonates of the alkalies produce in solutions of the same strength precipitates of cocaine alkaloid, which are at first amorphous, but which gradually take crystalline form, becoming ultimately identical in appearance with the crystals produced by caustic alkalies.

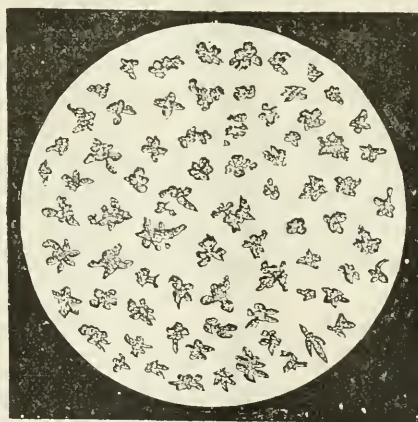


FIG. 5.—Precipitate formed by platinum chloride in solution, 1:500, of cocaine hydrochlorate. X 100 diameters.

Platinum chloride produces at once in solutions 1:400 a yellow precipitate, consisting of plumose crystals, mostly of stellate pattern, bearing thus a general resemblance to snow-flakes. (See Fig. 5.) In solutions 1:800 the crystals are more simple in form, consisting generally of one main crystal, with two or three parallel branches joined at an oblique angle, and these more or less subdivided. In solutions

1:1,600 most of the crystals resemble carpet tacks, consisting of a short, well-formed prism, with a single branch from the centre, joined at an oblique angle and tapered to a point.

A few crystals, similar to those just described, form after some time in solutions 1:3,000.

Chloride of gold produces characteristic crystalline precipitates, assuming peculiarly beautiful forms. In solutions containing one in 3,000 an immediate precipitate is produced, assuming forms resembling those of fern-fronds (Fig. 6), generally with a stellate arrangement.



FIG. 6.—Precipitate formed by auric chloride in solution, 1:3000, of cocaine hydrochlorate. X 75 diameters.

In solutions 1:12,500 crystals form after some minutes, showing the same fern-frond patterns, but not generally the stellate arrangement.

A solution was prepared of the amorphous cocaine (cocainoidine) in the form of a hydrochlorate, and a similar series of experiments carried out with this, the general conclusion drawn from which was that the compounds of this alkaloid are very averse to assuming the crystalline form. The precipitates produced by alkalies did not crystallize at all, neither that by picric acid. In very dilute solutions (1:5,000) the chloride of gold produced after some time minute prismatic crystals, wholly unlike in general appearance the compound fern-like crystals obtained when the crystallizable salt was employed. Similarly, in the more dilute solutions (1:1,000) chloride of platinum produced a few rosette-like crystalline aggregations, contrasting strongly in appearance with the feathery forms obtained from the crystallizable

salt. The limit of sensitiveness with different reagents was also in some cases strikingly different, although we must remember that the solution of the amorphous product is itself probably complex in character.

With alkalies the limit was found to be at a dilution of about 1:1000, with platinum chloride 1:1,200, with gold chloride 1:9,000, with picric acid 1:5,000 (that of the crystallizable salt being only 1:1,000), with Mayer's reagent 1:18,000 (that of the crystallizable salt being 1:200,000).

Solutions prepared from the amorphous alkaloid, if evaporated even at a very gentle heat, have invariably turned dark, and if the salt is evaporated quite to dryness it is found to be then imperfectly soluble in water. A solution of the crystallizable salt can be evaporated even at 100°C. without changing color, and the residue is perfectly soluble. It is probable, however, that the body which suffers decomposition in evaporation is a distinct alkaloid or a non-alkaloidal substance, for solutions which have been treated with animal charcoal, or by some other plans for purification, while they still contain amorphous alkaloid in abundance, do not exhibit this behavior.

One peculiarity of even the purest cocaine salts is their disposition to give up their acid, probably a result of the instability of the base. Steel spatulas, etc., exposed to the air in contact with the dry hydrochlorate soon become rusted, but the same thing is often observed in regard to the salts of ammonia and other volatile bases.

The important points which I wish to emphasize are: 1. That the alkaloid obtained from coca leaves consists of a mixture of several different substances, only one of which is entitled to the name of cocaine. 2. That the separation of normal cocaine from its accompanying alkaloids can only be effected by processes of crystallization, either of the alkaloid itself or of some of its salts.

In concluding I desire to express my obligations to the firm of Parke Davis & Co. for the use of their laboratory facilities, and especially for the material aid rendered by them in supplying the illustrations that accompany these notes. I trust that some one more burdened with leisure than the writer will be found to pursue lines of inquiry that I have been able only to indicate, and that our knowledge of the alkaloids of erythroxylon will soon be as full and exact as that of the cinchona group.

DETROIT, MICH., Aug. 24, 1885.

Remarks by the Editor.—As an acceptable supplement to the paper by Dr. Lyons, a botanical plate of *Erythroxylon Coca*, *Lamarek*, is added, from the leaves of which plant cocaine is obtained. For this plate, which is a reproduction of that contained in Bentley and Trimen's well known work on "Medical Plants," we are indebted to Messrs. Parke Davis & Co., of Detroit. The shrub which is doubtless indigenous to the mountainous districts near the West coast of South America, is extensively cultivated there, and also in the countries east of the Andes. A branch with young foliage and flowers is represented by Fig. 1. The flowers (Fig. 2) have a deeply five-lobed calyx (Figs. 4 and 5), five broadly-clawed petals provided with a ligula (Fig. 3), ten hypogynous stamens, and an ovoid ovary with three styles (Fig. 5), and divided into three cells (Fig. 7), of which two are usually abortive, so as to appear one-celled (Fig. 8). A longitudinal section of the ovary containing one ovule is shown in Fig. 6. The red fruit is drupaceous (Figs. 9 and 10), and at its base is surrounded by the calyx and short tube of the stamens; a transverse section of it (Fig. 11) shows a thin sarcocarp and endocarp, which is filled by the seed, and this contains within a thin testa, the straight embryo and tough albumen. The shape of the stipules and their attachment between the petioles and branches is shown in Fig. 12, and the apex of a leaf in Fig. 13.

ELIXIRS OF QUININE, SIMPLE AND COMPOUND.

BY R. ROTHER.

For obvious reasons, it is desirable that the various elixirs compounded by pharmacists should possess a definite and consistent structure and a general uniformity of the respective kinds. Their method of preparation should partake of a parallel character which, aside from simplicity and facility, should also attain a reasonable accuracy. Beside the distinctive medicinal agent, the characteristic base of all elixirs is an aromatic, sweetened, spirituous liquor. The Pharmacopœia has now recognized a simple elixir in accordance with these requirements. The official aromatic, although simple enough, is far from the best that might have been chosen. The superficial, evanescent and wholly illusive aroma of oil of orange is ill adapted in cases requiring coincidently a decided flavor of permanent character and

limpid solutions. More extended comparisons than have been heretofore made will doubtless show that the oils of orange and lemon are in so far objectionable, in conjunction with elixirs, that their discontinuance in the near future is very desirable. The multiform mixtures that are now so common are equally objectionable. Many simple aromatics are sufficiently grateful without admixture. And in cases of compounds two or at most three simple bodies are invariably superior to a greater number. The main point in their combination consists in finding their due proportions respectively to effect a blending. An excessive variety of compound flavors would be unwarranted. It is doubtless desirable that certain elixirs might be characterized by distinctive aromas, but for general use one particular combination is perhaps preferable. Among the simple flavors cardamom takes a high rank; orange flower water is also a superior flavor; then follow the oils of Ceylon cinnamon, caraway and anise; after which very little of an important or desirable nature remains, although peppermint, vanilla and tonka may sometimes be appropriate. As a compound flavor a mixture of one part of oil of anise and two parts each of oil of caraway and oil of Ceylon cinnamon is very grateful; even equal parts of the two latter form a very palatable compound.

The proportion of alcohol in elixirs should not be excessive. Whilst a considerable augmentation may be useful, in particular instances, to hold certain active constituents in solution, in the generality of cases its large presence would be detrimental by preventing solution. Three sixteenths, that is, one and a half pints, of alcohol in the gallon, is about the proper ratio.

No regard need be had about the alcoholic strength in reference to the solution of the aromatics. Unless the alcohol largely preponderates no perceptible increase of solvent power is attained, all inferior proportions having no greater effect than water alone.

Too little sugar or glycerin would not impart the requisite sweetness, but too much sugar would again exclude an indispensable proportion of solvent, besides imparting an undesirable syrupy consistence. Three-eighths, or forty-eight troyounces of sugar in the gallon is about the right proportion.

It has become habitual to color certain elixirs. Whilst this feature may in no case be essential, it certainly has the effect to relieve a monotonous uniformity. Cochineal is generally used for this purpose,

as it imparts to neutral and alkaline solutions a rich purple tint; acid solutions become scarlet tinted thereby.

In order to facilitate and effect the solution of the oily aromatics, it is customary to incorporate them first with magnesium carbonate. For various reasons this body is objectionable. The writer has for a long time employed precipitated calcium carbonate for this purpose, with very satisfactory results. The process of the Pharmacopœia by means of absorbent cotton is not to be recommended.

The incorporation of the medicinal agents is in many instances accomplished by direct addition. In some cases, however, a special procedure is necessary. But no very important deviation from the fundamental method of preparing the simple elixir is in any case required.

The process for preparing a simple elixir, and essentially most compound elixirs likewise, is based upon certain practical principles demanding at least average attention. The best results are invariably secured by combining the aromatic with the completed menstruum. This is effected by first dissolving the sugar in all the available water and then adding the alcohol; then thoroughly triturating the oils with the calcium carbonate, and gradually adding the menstruum, with constant stirring, until one-sixteenth to one-twelfth has been added; the resulting mixture is then poured into the remaining menstruum, and the whole well shaken at occasional intervals during a period of several hours, and finally filtered. The first small portions of the filtrate are apt to contain a trace of turbidity due to minute particles of calcium carbonate. The remainder, however, passes, beautifully clear and bright, and with acceptable rapidity.

The solution resulting from 48 troyounces of sugar and 4 pints of water measures about $6\frac{1}{4}$ pints. The addition of one and a half pints of alcohol increases this to about $7\frac{3}{4}$ pints, so that after filtration the measure of one gallon is completed by adding water through the filter.

The practice of employing alkaloids in preparing elixirs of cinchona in place of the bark has become almost if not wholly general. The sulphates being the commercial form are mostly used for this purpose.

In connection with iron salts the sulphates do not yield presentable products, and in contact with citrophosphates and citropyrophosphates not only are troublesome precipitates formed, but the resulting solu-

tions are destitute of the desirable light green tints, or speedily lose them, especially on exposure to light. The sulphates are furthermore marked by a persistent and nauseous bitterness, not shown by various other salts. For the reason of their remarkable solubility, moderate bitterness and wonderful permanence of composition, solubility and tint in conjunction with ferric citrate, the hypophosphites command particular notice.

The writer has long been in the habit of preparing an elixir of cinchona containing in the gallon 250 grains, one-third of a molecule, of cinchonium sulphate; 145 grains, one-sixth of a molecule, of quinium sulphate, and 128 grains, one sixth of a molecule, of cinchonidium sulphate; making a total of 523 grains, or two-thirds of a molecule.

Of late the writer has prepared this elixir, as well as its ferrated compound, by replacing the sulphates with hypophosphites. Since, however, these salts of the alkaloids are not obtainable in the market, and since, also, their composition relative to hydrous water is not known, the process embodies their preparation by double decomposition between the sulphates and calcium hypophosphite and solution in alcohol.

It was already found that the mixed sulphates of the alkaloids became mutually so extremely soluble that 8 fluidounces of diluted alcohol sufficed for the ready and complete solution of the 523 grains. With the mixed hypophosphites this solubility is naturally greater. The product obtained from the 523 grains of sulphates and 114 grains, two-thirds of a molecule, of calcium hypophosphite is completely dissolved by 2 fluidounces of warm water and little more than this volume of diluted alcohol in the cold. In strong alcohol the mixture is apparently soluble in all proportions.

From these results the following formula for elixir of cinchona or otherwise compound elixir of quinine is derived:

Cinchonium sulphate.....	250 grains.
Quinium "	145 "
Cinchonidium "	128 "
Calcium hypophosphite.....	114 "
" carbonate, precipitated	1 troyounce.
Oil of anise.....	8 minims.
" caraway.....	16 "
" Ceylon cinnamon.....	16 "
Sugar, granulated.....	48 troyounces.
Alcohol.....	
Water.....of each sufficient to make	1 gallon.

Dissolve the sugar in 4 pints of water and add 18 fluidounces of alcohol. Rub the oils thoroughly with the precipitated calcium carbonate and then gradually add, with constant stirring, 8 to 10 fluidounces of the preceding mixture.

Pour this now into the remainder of the saccharine solution and set the mixture aside, shaking it up frequently; then after an interval of about two hours filter it, returning the first turbid portion, and when all has passed through follow with water until the filtrate measures $7\frac{1}{2}$ pints.

Upon the calcium hypophosphite pour 2 fluidounces of water and warm the mixture on a water-bath. Now add the sulphates of the alkaloids, and when double decomposition is complete remove the mixture from the water-bath and gradually add 4 fluidounces of alcohol; then pour it into a small filter, and when all the liquid has passed through follow with alcohol until the filtrate measures 8 fluidounces. Then pour this into the simple elixir first obtained and mix the whole.

It was experimentally found that when ferric citrate, sodium phosphate and quinine are combined soluble double salts only resulted when having the composition $4(\text{FeCi})\text{Na}_2(\text{QuH})\text{PO}_4$, and $4(\text{FeCi})\text{Na}-(\text{QuH})\text{HPO}_4$. These could be produced in elegant olive tinted scales, but since they did not appear to redissolve in cold water, although freely so when hot, their hydrous water, if any, was not determined.

Ferric citrate and quinium hypophosphite combined, in whatever proportion, yield no soluble double salts; the presence of other hypophosphites appears to be necessary.

A grass-green scaled salt, having the formula $2(\text{FeCi})\text{NaPy}(\text{QuH})\text{-Py.Aq.}$, readily soluble in $\frac{3}{4}$ alcohol and in considerably stronger alcohol, yet only sparingly soluble in weaker alcohol, can be easily prepared. It is very difficultly soluble in cold, but abundantly soluble in hot water.

An apple-green, very soluble but non-deliquescent, scaled salt has the formula $3(\text{FeCi})\text{NaPy}(\text{QuH})\text{Py}$. Its hydrous water was not ascertained, but, as it can be obtained in two very different forms, it appears probable that hydrous water is present in one of the two conditions at least. When a concentrated solution is permitted to dry up spontaneously, a scaled but opaque residue remains, indicating a homogeneous crystalline tendency. If, however, the solution is concen-

trated and further dried by means of heat, perfectly clear and readily detachable scales are formed.

By uniting the constituents so that the expression $3(\text{FeCi})(\text{NaPy})_2 - (\text{QuH})\text{Py}$ results an apple-green solution is produced, which on condensation yields a similarly colored, scaled residue, intermingled by distinct groups of crystals. This product shows that the compound is not homogeneous, but that it is probably a mixture of the preceding salt and sodium hypophosphite. Further addition of sodium hypophosphite causes no disturbance or other visible effect.

Although the compound, having three hypophosphorous acid radicals is not a distinct salt, but a mixture, the writer gives it the preference over the other combination for use in elixirs. This is simply on account of the greater proportion of the medicinally desirable hypophosphites.

When employing a commercial article of ferric citrate in the preparation of elixirs especial care must be exercised not to use the so-called soluble kind, as this is merely the ammonio-citrate. Further care should also be had not to select a ruby tinted kind appearing in flat scales having an equilateral tendency. This is also a hydro-citrate, containing alkali, and hence of indefinite composition. The normal ferric citrate has a garnet tint and occurs in curved oblong scales; it is the only proper form to employ.

Strychnine readily combines with solutions of the double salts of the ferric citro-hypophosphites. And as all these solutions permanently retain their fine apple-green tints, this fact together with the foregoing conclusions has led to the following formula for an elixir of iron, quinine and strychnine. Each fluidrachm of this elixir represents about two grains of ferric citrate, one grain of quinium sulphate and one-sixty-fourth of a grain of strychnine:

Ferric citrate.....	261 grains.
Quinium sulphate.....	140 "
Sodium hypophosphite.....	68 "
Calcium ".....	28 "
" carbonate, precipitated.....	60 "
Strychnine, powdered.....	2 "
Oil of anise.....	1 minim.
" caraway.....	2 minims.
" Ceylon cinnamon.....	2 "
Sugar, granulated.....	6 troyounces.
Alcohol.....	
Water.....of each sufficient to make	1 pint.

Dissolve the sugar in seven fluidounces of water and add one and a half fluidounces of alcohol. Rub the oils thoroughly with the precipitated calcium carbonate, and then gradually add, with constant stirring, one to one and a half fluidounces of the preceding mixture. Pour this now into the remainder of the saccharine solution and set the mixture aside, shaking it up frequently; then after an interval of about two hours filter it, returning the first turbid portion, and when all has passed through follow with water until the filtrate measures 13 fluidounces.

Upon the calcium hypophosphite pour half a fluidounce of water, and warm the mixture on a water-bath. Now add the quinium sulphate, and when double decomposition is complete remove the mixture from the water-bath and gradually add one fluidounce of alcohol; then pour it into a small filter, and when all the liquid has passed through follow with alcohol until the filtrate measures two fluidounces. Then pour this into the simple elixir first obtained and mix the whole. Mix the ferric citrate, sodium hypophosphite and one fluidounce of water, and apply heat until complete solution has occurred. Now pour the elixir of quinium hypophosphite, previously finished, into this solution, and if necessary add water to the measure of a pint and mix the whole; then add the strychnine, and when this has dissolved filter the elixir if necessary.

Jacaranda lancifoliata. Under this name the leaves of a plant from Columbia, South America have been experimented with by Drs. Murray Smith, Alfred Wright and Z. Mennell, and were found to be very useful in cases of gonorrhœa, syphilis and in vesical affections attended with purulent urine ("Brit. Med. Jour."). The plant named, it appears to us, is identical with *Jac. procera*, *Sprengel*. A description of the leaves with analysis was published in this Journal 1882, pages 134 and 513. The leaflets are very variable in shape, and *Jac. lanceolata*, *Velloso*, we believe, is regarded merely as a variety of the species named.

It should be remembered that in Brazil the different species of *Jacaranda* and of other Bignoniaceæ are known as *caroba* and distinguished by various affixes, while the common name *jacarandá* is there given to various Leguminosæ; according to Peckolt, *Drenocarpus microphyllus*, *Wawra*, is known as *jacarandá-rosa* and *Machærium firmum*, *F. Allem.*, as *jacarandá-tau*.

J. M. M.

WHAT IS THE CHEMICAL RELATION, IF ANY, BETWEEN THE OILS OF PEPPERMINT AND SPEARMINT?

BY HENRY TRIMBLE.

Read before the American Pharmaceutical Association.

In answering this query it is necessary to assure the Association that the following experiments were made on pure oils. The purity of the samples was vouched for in every case by those who were personally acquainted with their manufacture.

Sufficient investigation has already been made of spearmint oil to prove that it is different from oil of peppermint, consequently attention has been directed to determining whether there is *any* chemical relation between them, and at the same time corroborating the work already done by others.

History.—Oil of spearmint appears to have been correctly analyzed by Gladstone ("Journal of Chemical Society," 1864), who stated that it consisted of a terpene, $C_{10}H_{16}$, and carvol, $C_{10}H_{14}O$. He separated them by fractional distillation, and by precipitating carvol by means of alcoholic ammonium sulphide.

The result is a mass of beautiful acicular crystals, readily purified by solution and recrystallization from hot alcohol, and, when pure, free from odor, composed of $(C_{10}H_{14}O)_2H_2S$. This compound decomposed by ammonia yields carvol, which has an odor resembling spearmint, although distinct from it. With the exception of the odor this carvol appears to be identical with that from the oils of caraway, dill and nutmeg. The oil examined by Gladstone showed a specific gravity at $14.5^{\circ}C$. of .9105.

Experiments on Oil of Spearmint.—Three samples were kindly furnished me by Mr. Albert M. Todd, the well-known manufacturer of pipmenthol. 1. A light fraction. 2. A heavy fraction, and 3. The natural oil. The light portion boiled at $174^{\circ}C$., had a specific gravity of .9078 at $15^{\circ}C$., and failed to deposit any crystals, except water, at $-23^{\circ}C$.

It was distilled under reduced pressure with a two ball fractioning tube. The light portion of this process was repeatedly rectified in the same way until a product was obtained of specific gravity .866 at $15^{\circ}C$., and boiling at 160° to $165^{\circ}C$. This was found on combustion to contain over three per cent. of oxygen. The odor of spearmint had

disappeared, a peculiar terebinthinous odor replacing it. The supply of this being exhausted, the natural oil was fractioned, the light portion treated with metallic sodium and distilled from it three times.

A combustion of this gave the following :

Carbon	84.42
Hydrogen	12.28
Oxygen.....	3.30
	<hr/>
	100.00

It was then allowed to stand over sodium for two weeks, and distilled. The first portion which came over boiled at 160° to 167.5°C., and had a specific gravity of .861 at 15°C. A combustion of this gave :

Carbon.....	84.52
Hydrogen.....	12.27
Oxygen.....	3.21
	<hr/>
	100.00

According to Gladstone the pure hydrocarbon boils at 160°C., and has a specific gravity at 20°C. of .860.

Another attempt was made to get the pure hydrocarbon by treating the oil with alcoholic ammonium sulphide, to remove the carvol, and rectifying the filtrate. But a decomposition occurred on heating this filtrate, and a greenish oil containing sulphur distilled over.

The second fraction in the distillation of the volatile oil, consisting largely of carvol, was submitted to a temperature of — 23°C. No separation of crystals occurred.

There remained in the flask after distillation, whether by direct heat or by forcing steam through the oil, a thick, dark brown, resinous substance, almost free from the odor of spearmint, and apparently a usual constituent of the oil. This will be referred to again under peppermint.

Experiments on Oil of Peppermint.—The oil of peppermint exposed to temperatures varying from — 10° to — 23°C. did not deposit crystals. It was then fractioned under reduced pressure, and the heavy portion crystallized by exposure to a low temperature.

For experiments on the light product of the oil, I used a sample sent me by Mr. Todd, who, at my request, favored me with about 4 ounces of a light oil, being the distillate gotten by taking 120 pounds of natural oil, distilling 5 pounds, taking 28 ounces of this and dis-

tilling 4 ounces. This was treated and distilled 3 times with sodium, then submitted to combustion with the following result :

Carbon.....	84.08
Hydrogen	12.19
Oxygen.....	3.73
	<hr/>
	100.00

As this contained so much oxygen it was allowed to stand on sodium for a week. The light portion gave on combustion :

Carbon.....	83.96
Hydrogen	12.28
Oxygen.....	3.76
	<hr/>
	100.00

This boiled at 163°C., and had a specific gravity of .855 at 15°C. Gladstone gives 175°C. as the boiling point of the hydrocarbon $C_{10}H_{16}$, and the specific gravity .8602 at 20°C. He does not, however, give his method of separation, and I fail to find that anybody has ever separated this compound. I do not give the result of the combustions as evidence that there is no hydrocarbon present, but to show that it exists in very small quantity, and that it is isolated with extreme difficulty, as already shown when the light portion resulting from the distillation of 120 pounds of the oil, rectified twice by Mr. Todd, still contained oxygen after prolonged treatment with sodium. Mr. Todd states as his opinion that the amount of hydrocarbon does not exceed 5 per cent. It is probable there is not even that much present. It is well known that a very small proportion of the hydrocarbon will prevent the crystallization of the pipmenthol.

After the distillation of the heavy portion of the oil, there remained a resinous mass very similar to that obtained from spearmint oil. It is probable that both oils contain this resin, and that the quantity is increased during the process of distillation. This view is the result of experiment, as well as of a statement from Mr. Todd that the distillate, in fractioning the oil, increases in specific gravity until the middle or latter part of the operation, when it begins to decrease, which is due, no doubt, to a decomposition, resulting in the formation of the resin.

Summary.—1. The oils of spearmint and peppermint probably contain hydrocarbons which are identical.

2. These hydrocarbons exist in much smaller proportion than heretofore supposed, and are isolated with great difficulty.

3. Oil of spearmint contains, as the oxygenated portion, carvol, $C_{10}H_{14}O$, which does not solidify at $-23^{\circ}C.$, and is precipitated by alcoholic ammonium sulphide.

4. Oil of peppermint contains, as the oxygenated portion, pipmenthol, $C_{10}H_{20}O$, which is a crystalline solid at ordinary temperatures, and is not precipitated, when in solution, by alcoholic ammonium sulphide.

5. Both oils contain resins, almost free from odor, and formed in part during the process of distillation.

ON THE PURITY OF COMMERCIAL SPANISH SAFFRON.

BY JOHN M. MAISCH.

Read before the American Pharmaceutical Association.

In order to obtain samples of Spanish saffron which would fairly represent its commercial quality, it was not deemed advisable to procure them from retail stores; but at the writer's request, a friend, who uses considerable quantities of saffron in his business, procured a number of samples directly from importers and large dealers, in the summer of 1884, so that the results of my investigation may be assumed to indicate the actual condition of the market in Spanish saffron as held in first hands. Two firms had each sent a specimen of Valencia and Alicante saffron, with the statement that the former was of their own importation, and the latter merely kept to supply to customers purchasing cheap goods. In the following synopsis the samples are grouped together in accordance with their relative purity, and are designated as was done by the dealer; the samples not specially designated, are understood to have been received simply as "Spanish saffron."

1. Valencia saffron. Of good appearance and odor, supple but not clammy; consists of the stigmas with a moderate proportion of the yellow style attached, and mixed with few stamens and a still smaller number of fragments of petals.

2. Valencia saffron. Closely resembling the preceding, and containing the same admixtures, in about the same proportion, except that the pollen seems to be present in somewhat larger quantity; this pollen floats upon water, does not separate a white sediment, and does not effervesce with acids.

3. Valencia saffron. Like the preceding sample, with which it closely agrees in all respects.

4. Valencia saffron. Resembles the preceding sample, but contains decidedly more of the style, which in some cases measures over 25 Mm. (1 inch); stamens and corolla fragments are present in moderate proportion.

5. The appearance of this sample is good, but very deceiving. It is free from stamens and powder, and contains but few styles and corolla tubes, also a few fragments of green crocus leaves, the latter doubtless an accidental admixture; but it is largely adulterated with calendula florets, dyed with red saunders in close imitation of the color of the stigmas of crocus.

6. Commercial Spanish saffron. Resembles the preceding sample; is free from corolla tubes, but contains, besides some styles, a few corolla fragments and many calendula florets dyed with red saunders.

7. This sample resembles those marked "Valencia saffron;" it contains a rather larger proportion of styles with a few corolla fragments, and is free from stamens; but it is loaded with a powder consisting of pollen and a moderate amount of calcium carbonate.

8. Although slightly clammy, the appearance of this sample does not excite suspicion; it contains a considerable proportion of styles, some yellow stamens and yellow calendula florets; but the principal amount of adulteration is dyed with Brazil wood, and consists of stamens, corolla shreds, corolla tubes, calendula florets, and of a powder composed of little pollen with much calcium sulphate.

9. Alicante saffron. More clammy than the preceding and resembling it, but free from calendula florets and the mineral adulteration consisting of calcium carbonate.

10. Identical with the preceding in composition and appearance.

11. This sample, weighing only a few grains, consists principally of corolla tubes with adhering powder of calcium carbonate, both dyed with Brazil wood, and containing a small proportion of saffron.

12. Likewise a very small sample, consisting largely of crocus stamens and corolla tubes with adhering powder of calcium sulphate, all dyed with Brazil wood, some of the crocus stigmas are rather light colored and have probably done service before, yielding now a rather pale reddish yellow infusion.

13. Does not contain a particle of crocus, but consists exclusively of florets of *Carthamus tinctorius*, *Lin.*, collected shortly after the

expansion of the flower-heads, when they are of a bright orange yellow color, and on drying acquire a red tint. The thin cylindrical tube of these florets is from 8 to 12 Mm. ($\frac{1}{3}$ to $\frac{1}{2}$ inch) long, and is above divided into five linear-lanceolate lobes 6 or 8 Mm. ($\frac{1}{4}$ or $\frac{1}{3}$ inch) in length; of about the same length is the yellow tube of the anthers, from which two short lobes of the stigma and a portion of the yellow top of the style projects about 2 to 6 Mm. ($\frac{1}{12}$ to $\frac{1}{4}$ inch); this portion of the style is cylindrical and like the outside of the terminal lobes, finely hairy, while the long lower portion of the style is filiform, smooth and of an orange red color.

A few weeks ago, on learning of a recent importation of Valencia saffron, application was made to the importer for samples, which were obligingly furnished. Each of the two samples weighed 30 grains, and since both were of very good appearance, entirely free from mineral additions, and had only moderate portions of the styles present, they were carefully searched for all other impurities present. In No. 14 were found two stamens and two corolla shreds not dyed, while from No. 15 were obtained three stamens of their natural color, and the following substances dyed with Brazil wood, namely one corolla tube, two corolla shreds and two calendula florets. The weight of these latter impurities is quite insignificant—less than one grain—and their presence in the samples may probably be accounted for by accident rather than design, although in lots of several hundred weights of saffron, the addition of two or three per cent. of material of no value would yield a snug profit, for which the purchaser did not contract to pay. This remark applies also to samples Nos. 1 to 4, described above.

Before referring to the different admixtures and adulterations, I may be permitted to state as the result of this investigation, my conviction that while Spanish (Valencia) saffron of fair quality can readily be obtained in our market, a large proportion of it (Alicante saffron) is more or less heavily adulterated; at the same time it should be remarked that not one of the samples is as good as it should be. There are upon the table three specimens of absolutely pure saffron, consisting solely of the stigmas without a trace of the yellow style, and of which one came to this country from Germany in 1871 as a special sample, another was raised in Lancaster county, Pa., about the year 1868, and the third was produced in Lebanon county, Pa., in 1882. It is to be regretted that the home product cannot be procured in suffi-

cient quantity to supply our market; this condition of affairs might perhaps be altered in the course of a few years, if dealers would consent to pay the price demanded by the domestic producers of saffron, namely an equal weight of silver coin. Sample No. 13 seems to indicate, that some persons are still selling safflower in the place of Spanish saffron.

In the investigation of the samples procured in 1884, no attempt was made to determine the percentage of impurities; but that there are different grades of "Valencia" saffron in the market, and that "Alicante" saffron is manufactured so as to contain sometimes much less than half its weight of crocus stigmas, becomes evident when price lists are consulted. In proof of this assertion the following statements are quoted from a trade circular from the southern part of France, issued near the close of July, 1885.

"No fresh supplies being brought to the Valencia market, on account of the cholera there, stock has decreased to about 10,000 lb., and although business appears at a stand-still for the moment, prices are kept firm and show an upward tendency. *Real extra superior Valencia* is wanting. *Superior Valencia* is being kept at francs 81·75 to f. 83·75 per kilo f. o. b. (= 29 shil. 8 pence to 30 shil. per lb. f. v. C.), and *good pure Valencia* fetches from f. 78·75 to f. 77.—per ko. f. v. C. as to quality (= 28 shil. 7 pence to 27 shil. 11 pence per lb. f. o. b.)—For *Alicante* adulterated saffron our makers on the spot ask, say for *extra superior Alicante*, f. 52.—per ko. f. v. C. (= 18 shil. 10 pence per lb. f. o. b.), and for *lower grades* from f. 40.—to f. 30.—per ko. f. o. b. as to quality (= 14 shil. 6 pence to 10 shil. 10 pence per lb. f. o. b.). All above quotations to be understood for cases of $\frac{4}{4}$ tins, each of 25 lb. net."

Nearly all European writers on materia medica have, during the present century, regarded French as being superior to Spanish saffron. A. L. A. Fée (Hist. Natur. Pharmac., 1828, I, 341), Guibonrt (Hist. Natur. des drogues simples IV), Soubeiran (Nouv. Diction. des Falsif., etc., 1874, p. 494), Baillon (Botan. Médic. 1884, p. 1422), and other French authors describe Gâtinais saffron as the best and purest, containing but few styles, while the saffron from Angoulême and Avignon contains a considerable quantity of this admixture. Soubeiran also states that Spanish saffron (doubtless the best quality is meant) differs little from that of Gâtinais, contains fewer yellow threads and is more dry and red; but that it is frequently adulterated. The same general

judgment is also alluded to by Andrew Duncan (Edinb. New Disp. 1805, p. 209) and by W. T. Brande (Manual of Pharmacy, 1825, p. 72), and is expressed by German and Austrian writers, who, however, place before the Gâtinais saffron that of Austrian origin, which consists of good sized stigmas, is free from styles and other impurities, but is produced in insufficient quantity to exert any important influence on the general market, conditions which apply equally well to the excellent saffron of Pennsylvania origin. Bentley and Trimen (Medic. Plants, p. 274) and Flückiger and Hanbury (Pharmacographia, p. 668) likewise state that French saffron is usually purer and enjoys a better reputation than that of Spain or Italy. How then, it may be asked, does it happen that in the United States, Spanish saffron is regarded as the best kind, and that most American writers praise it as such? In searching the literature on this subject, it was found that in 1834 (see Buchner's Repert., vol. 49, p. 458) F. Jobst pronounced the best and driest kind to be the Spanish saffron, which formerly had been usually oiled, a fact mentioned by J. A. Paris (Pharmacologia), A. T. Thomson (London Dispensatory, 3d edit., 1822, p. 267), F. P. Dulk (Phar. Boruss. Comment., 1829, I. 405) and others, and subsequently repeated by Royle (Mat. Med. Amer. edit., 1847, p. 601), Schleiden (Pharmacogn. 1857, II, 338) Clamor Marquart (Lehrb. d. Pharmacie, 1865, I, 385) and others. But Jobst's statement was corroborated by Pereira (Elem. of Mat. Med., 3d Amer. edit., 1854, II, 219) with this qualification, that Spanish saffron constitutes the best saffron of the shops, and that French saffron is usually considered in commerce to be of second quality. This, very likely, is the origin of the high esteem in which Spanish saffron has been generally held in American commerce and by most American writers.

The adulterations of commercial saffron may be divided into two classes, namely, such which are derived from the same plant, and such coming from other sources. The most common of the first class consists of styles, the presence of which has been observed in *all* commercial samples of Spanish saffron which have been examined by me on the present occasion, as well as formerly; the variations consisting merely in the relative proportion of these yellow threads. Next in order of importance are crocus stamens, which more than fifty years ago were remarked by Martius ("Pharmacognosie," p. 220), dyed so as to resemble the stigmas in color. The same adulteration was subsequently noticed by Bentley ("Phar. Jour. and Trans.," March,

1866; "Amer. Jour. Phar.," 1866, p. 225), and minutely described by him, with illustrations. Two years previous ("Jour. de Phar.," June, 1864), Guibourt perceived a similar adulteration in a specimen of French saffron, the dyed stamens, however, being those of *Crocus vernus*, *All.*, the anthers of which are cylindrical and rounded at the apex, while those of *Crocus autumnalis* are arrow-shaped. In the samples examined by me the latter alone were found; in some cases they still had their natural yellow color, in other cases they were dyed.

Bentley was the first one who observed also the presence of corolla tubes attached to the stamens of the saffron flower, and described them in the paper referred to. This adulteration seems to have attracted little attention; but it is evidently very extensively practised at the present time, as will be seen from the samples under examination, one-half of which are thus adulterated. When first noticed by me, and before it had been placed under the microscope, it was supposed to consist of meat fibres, which Duncan, Thomson, J. A. Paris ("Pharmacologia," 2d American edition, 1823, p. 123), Fée, F. V. Mérat and A. J. De Lens ("Dict. de Mat. Méd.," 1830, ii, 468), P. L. Geiger ("Handb. d. Phar.," 1830, ii, 355; "Pharmac. univ.," 1835, i, 55), J. F. Royle ("Mat. Med.," Amer. edit., 1847, 601), and others had enumerated among the adulterations of saffron. Some of the more recent German writers have repeated this statement; others merely give directions for the detection of such an admixture, and many, like all the recent French authors consulted by me, omit to mention it, doubtless because it has never been observed by them. Neither has it been seen by Pereira, for he, like Duncan, remarks (*loc. cit.*) that fibres of smoked beef *are said* to have been used for adulterating saffron, and J. R. Coxe ("Amer. Disp.," 1st edit., 1806) followed Duncan, using precisely the same language.

Some American writers are silent on this subject for the reason just stated; and I may add that various English, French and German journals of the present century have been searched in vain for a report on an authenticated case of such a sophistication; still it is mentioned by some American writers, apparently upon the authority of the early authors quoted before. Geiger ("Handbuch") describes these supposed fibres of smoked meat (ham) as being of uniform thickness, odorless, of little taste and not coloring the saliva, or, if dyed, imparting to it a slight yellow color. This description applies equally well to the corolla tubes. It should be stated, however, that, according to

Bentley and Trimen, the admixture of fibres of shredded beef is a common adulterant in Italy. The best means for detecting this adulteration is, without doubt, the microscope, which reveals the transverse striæ of meat fibres. The odor of burning meat differs materially from that of burning vegetable matter, and has been recommended as the principal test by most authors, even as late as 1865 by Marquart; but on experimenting with a few shreds only it may be misleading; it certainly should be regarded merely as a preliminary test, and the most reliable one, the microscope, is very properly insisted upon by careful modern writers.

The corolla tubes observed by me were dyed in one case with red saunders, in the others with Brazil wood. The frequency of this adulteration and its close resemblance to saffron suggested the probability of its having been overlooked in samples examined before; but those saffrons—many of them adulterated—which I had procured between 1866 and 1876 were entirely free from the tubes; it is possible that this sophistication is only occasionally used, or merely for certain cheap grades.

The petals of pomegranate, cut and twisted, were mentioned by Fée, Geiger, and by Dulk, and since their time by others, as being used for adulterating saffron, for which their crimson and after drying brownish purple color render them fit to a certain extent; but they contain tannin, giving with ferric salt a blue-black color, which was in no case observed with the corolla shreds taken from the samples under consideration. The petals of *Saponaria*, mentioned by some authors as adulterants, are almost white, and, to be used as an admixture to saffron, must therefore be dyed; seen under the microscope, they are nearly opaque, or merely translucent, while the corolla shreds—dyed and undyed—noticed by me were almost transparent, and their delicate structure was observed to be identical with shreds still attached to some of the filaments of crocus stamens, so that there can be no doubt of their origin.

From the above it would seem as if for some commercial grades of saffron the entire crocus flower was utilized, though not in the condition suggested by Monthus, in 1867 (*"Jour. Phar. Chim.,"* 4th ser., vi, 54), who recommended to simply dry the flowers, which he regarded as possessing the same medicinal properties as the stigma; he also states that acids color the flowers red, and ammonia green. Applied to calendula florets, acids render the yellow color lighter, but ammonia

darkens it. For the inferior grades of saffron the corolla tube is cut into pieces usually about 20 mm. ($\frac{4}{5}$ in.) long, the stamens are pulled off, and the corolla lobes are torn into shreds; these different parts are then dyed, somewhat rolled and twisted, and mixed with true saffron in sufficient quantity to suit the cupidity of the manufacturer and the price offered by the dealer.

Several of the substances used for adulterating saffron, and not derived from the saffron plant, have been mentioned above; in addition to these, a long array of vegetable substances are enumerated by different authors, and it is obvious that any material may be used which is thread-like or slightly clavate, or may readily be twisted into such a shape, and in addition to this possesses sufficient flexibility and may be dyed in close imitation of the natural color of saffron. It would, therefore, seem to be superfluous to mention any of these substances, since with the aid of the microscope—in most cases even to the naked eye, after a sample has been soaked in water—their different shape is at once revealed. The most important of these sophistications, besides those of mineral origin, consist of florets of composite flowers, more particularly of *carthamus*, which has been described above, and of the ligulate ray florets of *Calendula officinalis*, *Lin.* The latter attain a length of 20 or 25 Mm. ($\frac{4}{5}$ to 1 inch), and consist of a short tube and a long strap-shaped limb, 2 or 3 Mm. ($\frac{1}{12}$ or $\frac{1}{8}$ inch) wide, terminated at the apex by three teeth, and marked by four delicate longitudinal veins, of which two are marginal and beneath the teeth united with the two central veins. The limb is smooth, but the outside of the tube is covered with rather long, very thin-walled, colorless hairs, which in the dried condition are more or less twisted and collapsed, so as to present a somewhat moniliform appearance. If not dyed, these florets, on account of their yellow color, can be used for the adulteration of saffron only to a limited extent, perhaps not exceeding about 2 per cent. in weight, and may then readily be taken as portions of *crocus* styles. However, the dyed florets are more largely used, and, though many red coloring matters may answer for the purpose, the principal ones employed appear to be either red saunders or Brazil wood, both of which will impart a color similar to that of saffron. If dyed with red saunders, the coloring matter will not be taken up by water, but will dissolve in alcohol with a red, and in ammonia with a purple-red color. If dyed with Brazil wood, the infusion in water will be tinged red in a few seconds, the color becoming paler on the

addition of an acid, and deeper red on the addition of ammonia; but the infusion is not blackened by salts of iron. A few fragments of a red wood, found in two or three of the samples of saffron, showed the same behavior, and by microscopic examination and comparison with Brazil wood were proved to be identical with the latter. In order to make the dyed calendula florets more closely resemble true saffron, they are rolled or twisted in such a manner as to assume an approximately cylindrical shape. In several of the samples examined a number of elongated bodies, curved near one end, and there divided into several nearly cylindrical parts, were observed, bearing some resemblance to the stamens of papilionaceous flowers, deprived of the anthers. But the hairs described before at once revealed their true nature, and after soaking these bodies in water they could be separated into from 6 to 12 calendula florets, which during the manipulation for rendering them saffron-like had been twisted together by the strap-shaped portion of the petals, while the tubular parts remained distinct. It is very likely that the ray florets of *Calendula arvensis*, *Lin.*, as stated by Guibourt ("Jour. Phar. Chim.," May, 1841, p. 315), are used in precisely the same manner. The marigold of our gardens is very frequently this species, which is distinguished from *Calendula officinalis*, *Lin.*, by the more lanceolate stem leaves, the pale yellow and usually shorter ray florets, and the erect (instead of incurved) akenes of the outer row; the tubular portion is beset with the same kind of hairs.

Logwood could not be detected in any one of the samples examined; the crocus tubes, in most cases, also the corolla shrubs, and frequently the stamens, were dyed with either red saunders or Brazil wood. The stamens were also generally rolled in such a manner that the anthers were not readily recognized until after immersion in water, when they expanded and revealed their valves, the cells of which, near the margin, are somewhat irregularly quadrangular, and gradually change towards the connective to a transversely elongated form.

Several of the earlier writers on saffron mention sand and pieces of lead as mineral adulterants. The first account of a mineral salt, lead carbonate, being used for this purpose, I have found in the dictionaries of Chevallier, Richard, and Guillemin (1829), and of Mérat and De Lens (1830); subsequently it is rarely mentioned. The use of chalk in this connection appears to have been first noted by Heræus, but was not reported to a scientific journal until 1870, though published in the "Gazette de Marseille" in the fall of 1860. The same

adulteration was reported in 1869, in France, by Blacher, and in 1870, in Switzerland by Rehsteiner, in England by Hanbury, and in the United States by me. Gypsum was also observed as an adulteration in the year 1869 (*"N. Jahrb. Phar.,"* xxxii, xxxiii), and since that time both calcium salts, occasionally also the corresponding barium salts, have been invariably found as fraudulent admixtures in certain grades of Alicante saffron, rendered somewhat adhesive by means of honey, glucose or glycerin, which substances, owing to their hygroscopic nature, have the additional advantage of preventing the saffron from getting too dry.

Adulterations with exhausted saffron were practiced at an early day, and are mentioned, in 1718, by John Quiney (*"Pharmacopœia officialis et extemporanea,"* p. 164), and in 1733 by James Alleyne (*"Engl. Dispens.,"* p. 36).

The conclusion that may be drawn from these facts and statements is that saffron, in common with every medicinal article, should be carefully examined by the purchaser for all possible admixtures; for unceasing vigilance is the best if not the only guarantee for the purity of drugs.

ON THE MEDICAL PROPERTIES OF TWO RHAMNUS BARKS.

BY GEORGE W. KENNEDY.

Read before the American Pharmaceutical Association.

Query 21. Is there any difference in the laxative action of *Rhamnus Purshiana* and *Rhamnus Catharticus*?

Experiments undertaken with the view of answering this query require considerable time and labor, since a number of important points are to be taken into consideration in order to be able to reach a satisfactory conclusion, and the omission of either one will cause more or less uncertainty in the results. One of these results is the proof that the two drugs under consideration require somewhat different menstrua for stable liquid preparations, since the menstruum which will thoroughly exhaust the virtues of one of the drugs and hold the principles in perfect solution, will not answer for the other. In order to ascertain if possible the relative strength of these two drugs the fluid extracts were believed to be the most convenient and satisfactory form for experimentation, and they were prepared as follows:

Take of the bark in moderately fine powder.....	℥xvi
Alcohol (95 per cent.)	f℥xi
Glycerin.....	f℥ij
Water.....	f℥iii

Mix the above fluids, moisten the powder with a portion of the mixture, pack properly in a glass conical shaped percolator, cover the surface of the powder with a disc of paper, and add the remaining menstruum. When the liquid begins to drop from the percolator, close the lower orifice with a cork, and having closely covered the percolator, to prevent evaporation set it aside in a moderately warm room for four days. The cork is then removed, more menstruum, composed of eleven fluidounces of alcohol and five fluidounces of water, is added gradually, and the percolation continued until twenty-four fluidounces are obtained of which the first thirteen are reserved; the remainder is carefully evaporated to two fluidounces, then add one fluidounce of alcohol, and mix with the reserved portion.

This menstruum is not sufficiently strong in alcohol to make a permanent preparation of *Rhamnus Catharticus*; but by increasing the alcohol in the above formula to twelve fluidounces in the pint, excellent results were obtained and no precipitation of any consequence took place in the fluid extract after standing for several months. When made of the weaker alcoholic menstruum a deposit took place shortly after the preparation was finished, but none occurred in the fluid extract of *Rhamnus Purshiana*, which was made about nine months ago. The taste of the two preparations differs somewhat; while that of *Rhamnus Catharticus* is unquestionably very bitter, yet it is not near so strong as the bitterness of the *Rhamnus Purshiana*.

To satisfy myself that the drugs were thoroughly exhausted the powders were administered and found to have no laxative properties whatever. The precipitate alluded to above, a portion of which I collected by decantation, was of a brownish color and dissolved completely in liquor potassæ, with a deep purplish-red color, characteristic of the resin. By the addition of dilute acetic acid the purplish-red color of the alkaline solution was immediately destroyed, and a brownish colored mass thrown down, which was thrown into a filter, repeatedly washed with water, and dried. It is soluble in alcohol, diluted alcohol, and the alkalis, insoluble in chloroform and ether, and nearly so in water, thus corresponding in appearance and tests

with the rhamno-cathartin found in the juice of the buckthorn berries by Binswanger, in 1849. Repeated attempts to crystallize this substance were not successful. On being administered in four grain doses it had a decided cathartic action, and in doses of three grains was strongly laxative.

The separation of this substance from the fluid extract induced me to investigate the subject a little deeper than at first intended. Accordingly a small quantity of the resin was made from each bark by a process noticed below, and the yield ascertained, as well as the medicinal action. In the meantime the fluid extracts were placed at the disposal of several of my medical friends who rendered me valuable aid and reported their conclusions, which agree so closely in the more important points, that it would be superfluous to give them all in detail.

The following report from Dr. I. D. Wiltrout, of Hudson, Wis., appears to cover the subject quite thoroughly:

"The samples of fluid extract of *Rhamnus Catharticus* and *Rhamnus Purshiana* given me for trial have more than met my highest expectations. I used these preparations in cases of constipation characterized by atony, or paresis of the muscular coat of the bowels, induced by a catarrhal condition of the stomach and small intestines. They gave free evacuations in small doses, say from 30 to 50 drops, with no pain, and materially improved the appetite. The evident action is upon the nerve terminals and in this way reflectly stimulating muscular contractibility and glandular secretions. The common experience was that a diminished dose was needed to assure the daily purpose. I also used the remedies on women in whom the colon was allowed to distend from neglect and inattention; in all instances they were efficient. I think these remedies might be usefully prescribed with aloes when there is no pelvic or uterine difficulty, and thus act on the whole bowel. I have prescribed these remedies in combination with the phosphate of sodium in chronic constipation, attributable to a bilious condition. It wonderfully accelerates the action of the phosphate and arrests a sick headache promptly, and does not deplete the system. I think these remedies have a wide province and if the extracts are always as reliable as those you sent, will be used in the cases enumerated. I have prescribed these remedies in a large number of cases and my conclusions as to their relative strength is, that a smaller quantity of the *Rhamnus Purshiana* is required both as a laxative and as a cathartic, but it is a little nauseating."

In regard to the squeamish action of the drug noticed by Dr. Wiltout, in the *Cascara Sagrada*, this has likewise been observed in the bark of the *Rhamnus Frangula* the first year after gathering, but when two or three years old retains only the purgative power, and is much similar in its effect to that of rhubarb, consequently most authorities forbid its use until two years from the time it is gathered, and the Norwegian Pharmacopœia requires the bark to be kept one year before it is used medicinally. The glucosic fermentation which is now admitted to take place by age in the *Frangula*, may likewise take place in the *Purshiana*. On this point I am unable to give an answer as I could not ascertain the age of the bark operated on.

The resins of both species were obtained from the concentrated alcoholic tinctures by adding them with constant stirring to water, when subsidence had taken place, decanting the supernatant liquids, washing the precipitates twice by decantation, with fresh portions of water, and drying them.

Eight ounces of the bark was operated on in each case. The bark of *Rhamnus Purshiana* yielded 250 grains, or about $6\frac{3}{10}$ per cent. of resin, which is dark in color and almost black, but if dissolved in caustic potash solution and precipitated by diluted acetic acid it is of a brown color. It is very bitter, of a granular appearance, and contains a small quantity of a yellow fixed oil, which on a piece of white paper produces a greasy stain. The resin is soluble in alcohol, diluted alcohol, in sulphuric acid with a reddish brown color, and in liquor potassæ with a purplish red color; it is insoluble in chloroform and ether. In doses of 1 to 3 grains it acted as a laxative and cathartic. The extractive matter obtained by evaporating the water used in precipitating the resin amounted to $1\frac{1}{2}$ ounces, or $18\frac{5}{10}$ per cent., making a total yield of both of $24\frac{8}{10}$ per cent. The watery extract is of a dark reddish brown color, when perfectly dry breaks with a snap, the fracture being glossy, but when exposed to damp air it becomes soft and sticky; it has an intensely lasting bitter taste, much stronger than the precipitated resin, and its physiological action is similar, 2 to 3 grain doses having laxative effects, and 5 grains acting as a cathartic. It is soluble in a large quantity of water, freely so in dilute alcohol, sparingly soluble in alcohol, and almost insoluble in chloroform and ether; with sulphuric acid it forms a reddish brown solution, and with liquor potassæ makes a clear solution of purplish red color.

The yield of resin from the *Rhamnus Catharticus* is not so large as

from the former, 8 ounces yielding 160 grains or $4\frac{1}{6}$ per cent., and by evaporating the aqueous fluid used in precipitating the resin 210 grains or $5\frac{5}{16}$ per cent., making a total of 370 grains or $9\frac{2}{3}$ per cent. The resin is found to be soluble in diluted alcohol, alcohol, in liquor potassæ with a claret wine color, in sulphuric acid with a red color; also in ether and chloroform, but insoluble in water. The aqueous extract was soluble in water, sparingly soluble in alcohol, soluble in dilute alcohol, insoluble in ether and chloroform, soluble in liquor potassæ with a purplish red color and in sulphuric acid with a reddish brown color. As to the laxative and cathartic properties of these two I found the resin decidedly the stronger, requiring 3 grains for a laxative action, while the aqueous extract required 4 to 5 grains to have the same effect.

From the above observations on the resins and extracts obtained from these barks, I would unhesitatingly conclude that the preparations manufactured from *Rhamnus Purshiana* are decidedly the more active. Before closing I desire to return my thanks to Messrs. Parke, Davis & Co., of Detroit, Mich., who kindly accommodated me with material to make these investigations.

TINCTURE OF VANILLA.

BY R. ROTHER.

After vanilla pods there are few if any other crude articles to be found in mercantile pharmacy having such a diversity of quality as inferred from their market value. In consequence, tincture of vanilla for flavoring purposes can be prepared rich in vanilla at a relatively moderate cost, and scant in vanilla at a comparatively exorbitant cost. Connoisseurs claim that they can easily discern the differences in these various preparations. Since, however, the consuming public are in no sense experts in such matters, all grades of these products find a ready market. Viewed from the standpoint of the trained palate, the public taste is exceedingly perverted when it deliberately prefers tonka-mixed vanilla or even tonka pure and simple to the best vanilla.

Manufacturers of flavors have not been slow to recognize the advantage of such a disposition to themselves, and as a consequence of the greatly increased demand the cost of tonka bean has steadily risen to an unprecedented level of late years. The cost of vanilla has, however, appreciably declined. That this was caused by the introduction

of artificial vanillin and the decreased demand for pure vanilla flavor is, however, not the case. The probable reason is very likely to be found in the new natural sources of supply that have of recent years been developed. The fresh supplies appear to be so abundant and rich that the natural vanillin obtained therefrom has not only crowded out the synthetic article, but incidentally reduced the cost to a remarkable degree.

The Pharmacopœia has at this late day embodied a formula for tincture of vanilla. It bears a rather antique form, and it is perfectly safe to add that pharmacists who have occasion to prepare large quantities of the tincture will ignore the official process in every particular. In this preparation there is no need for the presence of any sugar whatever. Such an unusually strong alcoholic menstruum as is officially used is also unnecessary, to say nothing of the objectionable features still outstanding.

Macerating the sliced pods with diluted alcohol constitutes the simplest and best process that can be applied. Where much material is operated on, the extraction is preferably accomplished by the procedure of maceration. When tonka is conjointly used the operation need not be varied, as its relation to the menstruum is even more favorable than that of vanilla. The crude material may be exhausted with diluted alcohol, separately or coincidently. Their combined extraction is, as a rule, more convenient.

A tincture containing one ounce of each vanilla and tonka in the pint is very satisfactory, although half an ounce of tonka may ordinarily suffice.

Estimating that the yield of vanillin from vanilla pod is 2 per cent., and that of coumarin from tonka bean the same, then eight troyounces of each will contain, in round numbers, 80 grains of the principles respectively; it is, however, allowable that it is much less even from apparently the best material. This amount of pure principles costs scarcely half that of an equivalent quantity of good crude substance. However, the writer has for some time past prepared a tincture from pure crystallized vanillin and coumarin, containing three drachms of the first and one drachm of the second, or half a troyounce of the two together, in the gallon. This is twice the best possible yield of the crude material, or twice the ordinary strength of the tincture. As the composition here is largely in favor of vanilla, the cost of the resulting product is correspondingly enhanced. It is, however, barely more

than half that of a proportionate amount of the raw product. This tincture is therefore twice as strong at half the cost of that as ordinarily made, or a difference in its favor as four to one.

Although diluted alcohol is necessary for extracting the activity from the crude substances, a much weaker alcohol will suffice for simply holding the principles in solution. Two pints of alcohol to the gallon of tincture is ample. The crystals dissolve but slowly in 25 per cent. alcohol, but almost instantly in strong alcohol, which solution may then be diluted without change. It has been deemed advisable to add some glycerin to the tincture, as it is held that such addition is beneficial in bringing out flavors of all kinds. The tincture is colored with liquid caramel or sugar color, and thus presents the full appearance of that obtained from the natural bodies. It is prepared according to the following formula :

Vanillin, crystallized.....	3 drachms.
Coumarin, "	1 "
Caramel, liquid.....	2 fluidrachms.
Glycerin.....	4 fluidounces.
Alcohol.....	2 pints.
Water.....	sufficient to make 1 gallon.

Dissolve the vanillin and coumarin in the alcohol and add four pints of water. Mix the caramel and glycerin with one pint of water and pour it into the first solution, together with enough more water to make the tincture measure one gallon, and filter it if necessary.

CHOLAGOGUES.—Dr. Baldi, in the *Archives Italiennes de Biologie*, gives a series of experiments with reputed chologogues. The Doctor is not in accordance with either Rohrig or Rutherford. Rohrig found that colocynth was the most active chologogue, and then jalap, aloes, senna, and rhubarb. Rutherford believed the order to be, prodophyllin, rhubarb, aloes, colocynth, and senna. Baldi experimented with podophyllin, rhubarb, jalap, pilocarpine, and Carlsbad water; and from his results is inclined to doubt the chologogue value of all these agents.—*Pac. Med. and Surg. Jour.*, May, 1885.

JABORANDI IN OBSTINATE HICCOUGH.—Pagenstecher (Centbl. f. d. ges. Therap.) reports a case of hiccough which had resisted every known remedy, including the bromides, morphine, chloroform, and electricity. The patient's diaphragm contracted in the most violent manner about twenty or thirty times a minute, and he had been unable to take any nourishment for three days. After receiving four grams of jaborandi-leaves, in the form a decoction, he had a profuse perspiration, after which the hiccough was completely checked.—*The South. Pract.*, May, 1885

GLEANINGS FROM FOREIGN JOURNALS.

BY J. ROBERT MOECHEL.

Detection of Blood in Urine.—A new, sure and simple method by means of which the peculiar color of blood is obtained is given by Antonio Luchini in "L'Orosi." To 10 cc. of urine, in a test-glass, add one drop of acetic acid and 3 cc. of chloroform, and shake well. In the presence of blood, the subsiding chloroform will show more or less of the red blood-tint, according to the quantity of blood present. Luchini experimented with personally prepared solutions of blood, and observed the reaction to be successful with a solution containing 3 drops of blood in 250 cc. of water.—*Schweiz. Wochenschrift f. Ph.*, 1885, p. 220.

Diphenylamine, $(C_6H_5)_2NH$, is a very delicate reagent for the detection of nitrogen acids and for free chlorine. H. Hager recommends two solutions as being convenient for use: 1, 1 gram of diphenylamine in 30 cc. of absolute alcohol, and, 2, a mixture of 1 volume of this solution with 5 or 6 volumes of pure sulphuric acid, as diphenylamine sulphate. Both solutions are yellowish, and the latter becomes blue in the presence of nitrogen acids and other oxidizing agents.

For the detection of chlorine, place 3 or 4 cc. of the suspected liquid in a test-tube of 1 cm. width and pour 1 to 1.5 cc. of sulphate of diphenylamine carefully down the side of the tube, so as to let it collect on the bottom. According to the quantity of chlorine present, a blue coloration will be observed between the layers of the two liquids, or the whole of the lower liquid will be colored blue. Very slight traces may be detected if to 3 or 4 cc. of liquid 1 to 5 cc. of diphenylamine sulphate be added with the care stated above, so as to have two layers. Place the tube upon a sheet of white paper and shake well; a transient blue coloration, rapidly vanishing, will be observed; somewhat larger traces of chlorine show the blue color for a longer time.—*Ph. Centralhalle*, 1885, pp. 277-279.

Naphthol, $C_{10}H_7OH$, is a delicate reagent for the detection of nitrates and the nitrogen acids, though not as delicate as diphenylamine. Hager succeeded in detecting 1 in 5,000 and obtained a fainter, but still distinct reaction with 1 in 8,000 parts. The solution for use contains 1 part of naphthol in 100 parts of strong or absolute alcohol. For applying the test, place in a test-tube, of 1.2 cm. width, 3 or 4 cc.

of the colorless (or nearly so) suspected liquid; mix with 2 cc. of the above solution, and add carefully 1.5 to 2 cc. of pure concentrated sulphuric acid, as stated under dyphenylamine. Suddenly, or in a few seconds, the acid surface assumes a yellow, reddish brown or brownish black coloration. For the detection of traces of the acids (1 in 5,000), add at first but 1 cc. of pure sulphuric acid; after a minute shake and mix; then add with care 1.5 cc. of pure sulphuric acid, and wait 1 to 2 minutes, when the surface of the acid shows a dark color. After 4 or 5 minutes shake well, to mix the fluids, which, if the nitrogen acids were present in very slight traces, will have a decidedly yellowish color. By adding sulphuric acid in three portions a yellowish color, resembling that of white wine, was obtained with $\frac{1}{8000}$ HNO_3 .—*Ph. Centralhalle*, 1885, p. 353.

Naphthol as a Reagent for Free Chlorine and Bromine.—Chlorine or bromine give with a 1 per cent. solution of naphthol in alcohol a whitish turbidity and precipitate, the latter assuming from chlorine a yellowish green and from bromine a yellow color. If the detection of mere traces of chlorine and bromine be the object, place in a narrow test-tube 3 or 4 cc. of the liquid to be tested, and then pour down along the side of the test-tube 0.5 cc. of the naphthol solution; in a few minutes a white turbidity will be observed between the two layers, extending when slightly shaken. If the two layers be mixed, a white opalescence or turbidity will be the result. Traces of chlorine will show, in about 15 to 30 minutes, a greenish tint; bromine, a yellowish one. Chlorine or bromine, 1 in 30,000 of liquid, will show the reaction in a few minutes; if in 40,000 parts of liquid, 10 to 12 minutes were required, and this is about the limit of dilution for this reaction. Care as to the dilution is needed; for instance, hydrochloric acid ought to be weaker than 20 per cent., nitric acid about or weaker than 10 per cent., etc.—H. Hager, in *Ph. Centralhalle*, 1885, p. 366.

Orange Wine.—Pour upon the peel of two or three oranges, placed in a vessel, 1 liter of hot white wine; cover and set aside for three hours. Dissolve 625 grams of sugar in half a liter of pure water; mix the resulting syrup when cold with the vinous infusion, and, if desired, color with saffron; filter and bottle.—*Science pratique; Leitm. Rdschau*, 1885, p. 432.

Cement for Plaster Casts.—Macerate small pieces of celluloid in ether; pour off the light liquid and use the remaining thickish mass

as cement, which dries quick and is insoluble in water.—*Ibid.* from *ibid.*

Excellent Polishing Powder for Metals.—Magnesia 40 parts, carbonate of calcium 40 parts, red oxide of iron 7 parts.—Chevalier, in *ibid.*

Cement for Tubes of Glass and Copper.—Mix very finely powdered gypsum with oil until the mass becomes somewhat hard; then for every 50 parts of oil incorporate 100 parts of albumen by trituration in a mortar. This cement must be used at once, since it hardens rapidly.—*Ibid.* from *ibid.*

A permanently elastic solution of acacia is, according to "Wien. ill. Gew. Ztg.," obtained in the following way: Dissolve 93 parts of acacia in sufficient water to obtain a liquid of syrupy consistency. Dissolve 1 part of salicylic acid in 20 parts of alcohol; add 3 parts of glycerin and, lastly, 3 parts of green soap, and mix. This solution keeps well, and besides being very elastic possesses considerable adhesiveness.—*Erfind u. Erfahr.*, No. 9, 1885.

Antidiabetic Chocolate.—Glycerin, 500 grams, is to be reduced, at a low temperature, to 300 grams; then melt 1,000 grams of Caracas cacao, freed from oil, and stir with the glycerin until incorporated. Salts, aromatics, sugar, etc., may be added if ordered by the physician.—*Bulletin gén. de thérapeutique*, 1885, p. 512.

In place of reducing the glycerin by evaporation, use only 300 grams of concentrated glycerin, thus avoiding the loss of 200 grams of glycerin.

Remedy for Freckles.—Halkin ("Ann. Soc. de Liège") recommends to proceed as follows: Wash the skin well and dry; then paint the spots by means of a brush which has been slightly dipped in melted carbolic acid, at the same time stretching the skin by means of the fingers. Let dry without washing or removing the forming skin, which after some time assumes the natural color.—*Ph. Centralhalle*, 1885, p. 344.

OXALIC ETHER.—Richardson ("Asclepiad") recommends this compound for hypodermic injection. It is obtained by digesting absolute alcohol and oxalic acid at a moderate temperature, and is a colorless liquid of an agreeable odor. Unlike sulphuric ether, it does not cause pain when injected under the skin, and the resulting inflammation is slight. It is suggested as a useful application to morbid growths, either externally or by deep injections.—*N. Y. Med. Jour.*, June 20, 1885.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from page 435.)

Culantrillo de México, *Adiantum tenerum*, *Swartz*; Filices; in Central Mexico. The pinnae are dark green, rhomboid, wedge-shaped at the base, the inferior margin entire, and the superior one lobulate in the fertile fronds, and dentate in the sterile fronds; the stalks smooth, shining and blackish. It is employed as a substitute for the European maiden hair, and in Guadalajara the decoction (two to four drachms to a pint of water) is much used as an aperient and for promoting the flow of the lochia.

Cundeamor, *Momordica Charantia*, *Lin.*; Cucurbitaceæ; in Tabasco and Yucatan. According to Leon the leaves are anthelmintic, and the roots aphrodisiac.

Curaro, Onrari, Wourari. The dose cannot be fixed. It may be given in injections of 0.001 Gm. frequently repeated until the physiological effects are produced.

Chaulte, *Blettia campanulata*, *La Llave*; Orchidaceæ; in temperate regions of Mexico. A decoction of the tubers of this plant is used in dysentery. In like manner are employed the tubers of allied plants, such as *Blettia coccinea*, *La Ll.*, *Epidendrum pastoris*, *La Ll.*, *Arpophyllum spicatum*, *La Ll.* and others.

Chayote, *Sechium edule*, *Swartz*; Cucurbitaceæ; cultivated. The fruit and little tubers are alimentary. A. Herrera found in the fresh tubers potassium tartrate and other salts, albumen, sugar, bitter resinoid matter, and 20 per cent. of starch which is employed as a substitute for arrow root.

Chia, *Salvia Chian*, *La Llave*; Labiatae; in the central table-land of Mexico, and cultivated in various parts of the Republic. Oliva found in the seeds starch, drying oil and mucilage. Mixed with water their bulk is considerably increased; this mixture flavored with sugar and lemon juice, furnishes a refreshing drink. The seeds are also used in the form of cataplasm as an emollient, and introduced into the eye for extracting therefrom extraneous bodies. (See also "*Am. Jour. Phar.*," 1882, pp. 227, 229, 261, 585.)

Chicalote, *Argemone mexicana*, *Lin.*, *A. ochroleuca*, *Salm.*, and

A. grandiflora, *Salm*; *Papaveraceae*; in the valley of Mexico, etc. The milk juice is used in skin diseases and mixed with water, for removing from the cornea incipient opacities and spots. The flowers are pectoral and narcotic. The leaves, externally applied, are a remedy against headache, and are stated to contain a small quantity of morphine. Dr. Hamilton found the seeds to be narcotic, and the fixed oil obtained from them is drastic in doses of fifteen to thirty drops.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-third annual meeting of this Association convened in Lafayette Hall, in the city of Pittsburg, on Tuesday afternoon, September 8th, President John Ingalls in the chair. The Local Secretary, Mr. G. A. Kelly, introduced Mr. G. H. Anderson, Vice-President of the Chamber of Commerce, who tendered the use of the rooms of that body for any business connected with the meeting, and extended a hearty welcome from the business men and citizens to the members. The President, on behalf of the Association, returned thanks, and then proceeded to read his annual address, which, on motion of Prof. Markoe, was referred to a committee for considering and reporting upon the suggestions contained therein. Mr. Kelly then spoke words of welcome on behalf of the resident members and of the pharmacists and druggists of Pittsburg and Allegheny City; he also stated that a number of industrial establishments would be open for inspection by the members and their friends, and read a letter from the Petroleum Exchange, inviting the members to visit their building. These invitations were accepted with thanks.

The Permanent Secretary read the report, showing that delegates to this meeting had been appointed by 12 Colleges of Pharmacy, 24 State Pharmaceutical Associations, 10 County or City Associations, and 6 Alumni Associations.

On motion of Prof. Oldberg the Secretary was directed to send a message of greeting to the British Pharmaceutical Conference then in session in Aberdeen, Scotland.

On motion of Dr. Menninger the members of the Medical and Pharmaceutical professions of Pittsburg and vicinity were invited to the sessions, with the privileges of the floor.

Mr. M. N. Kline, in behalf of the delegation from the National Wholesale Druggists' Association, made some remarks, commenting on the aims of, and the work done by, the American Pharmaceutical Association. On behalf of the latter Mr. Sheppard responded.

The reports of Committees were then called up, and laid upon the table for future action, after which the Nominating Committee was appointed and the minutes of the Council sessions during the past year were read, also the reports of the Publishing Committee and of the Committee on Membership, the latter showing a slight decrease in the number of members as compared with the previous year. The report of the Committee on

Prize Essays was made by one member, owing to the absence in Europe of another, and the illness and death of the third member; it was referred to the Council for further action. After the appointment of several committees, a motion to adjourn until Wednesday morning was carried.

The second session opened with the reading of the minutes of the preceding day and of the Council, and the report of the Nominating Committee, followed by the election of officers for the ensuing year. Mr. Jos. Roberts, of Baltimore, was elected President; A. H. Hollister, of Madison, Wis., Prof. A. B. Prescott, of Ann Arbor, Mich., and Joseph S. Evans, of West Chester, Pa., Vice-Presidents. The remaining officers and retiring members of Council were re-elected; the formation of the Committee on the Drug Market was postponed, and the other standing committees were left unchanged, except that Prof. V. Coblentz, on the Committee on Papers and Queries, took the place of Mr. Sloan, declined, and Prof. Oldberg, on the Committee on Prize Essays, the place of Mr. Parsons, deceased.

The report of the Drug Market was read by Mr. M. N. Kline, and was ordered to be printed in circular form for distribution to the members, and to be published in the Proceedings.

The report of the Finance Committee contained various suggestions, chiefly in relation to the annual audit of the Treasurer's accounts. In compliance with the regulation of the Council, made for the purpose of affording ample time for the thorough examination of the books and accounts, the Treasurer reported on the financial condition of the Association on July 1st, which is the beginning of the financial year, instead of at the time of the meeting, as was customary heretofore; on this account the report shows a smaller cash balance than would otherwise have been the case. As verified by the Auditing Committee, the funds of the Association on the 1st day of July were as follows: General fund, cash in bank and on hand, \$4,278.79; Permanent fund from life memberships, etc., \$1,429.47; Ebert fund, \$729.55; Centennial fund, \$1,359.36.

The Committee on Legislation pointed out some of the differences in the pharmacy laws, showing that there is no unity of sentiment or action in regard to the fundamental principles which should guide pharmaceutical legislation. The failure before Congress of the bill relating to apothecaries of the Army and Navy was reported, and a synopsis was given of the requirements, together with the full text of the new pharmacy laws of Kansas, Maine, Massachusetts, Michigan and Minnesota, as well as such portions, relating to pharmacists, of the prohibitory laws of Kansas of March 7, 1885, and of the new penal code of Minnesota.

The Committee on Legislation on Proprietary Medicines presented a carefully prepared argument in favor of requiring each package of such medicines to contain a sufficient statement of the composition; also the draft of a law for regulating the sale of proprietary medicines. The resolution attached to the report and adopted by the meeting declares "that it is the deliberate opinion of this Association that the labels of proprietary medicines ought to carry a statement of their constituents."

A report was read from the delegation to the meeting of the National Wholesale Druggists' Association at St. Louis, and from the Committee on Unofficial Formulas.

A number of amendments to the by-laws previously proposed were then acted upon, as follows:

Chapter IX, Article II, Sect. 4, was altered so as to abolish the calling of the roll at the first session; and Sect. 7 so as to constitute the Nominating Committee from representatives of the delegations of Colleges of Pharmacy and State Pharmaceutical Associations. Article IV of the same chapter was amended so as to devote the third and subsequent sessions to the reading of papers, with the exception of the first hour, when other business may be transacted, under the proviso that the reading of papers may be suspended with the consent of three-fourths of the members present at the remaining sessions. Other matters occupied the attention of the Association repeatedly during the time set apart for the papers, and it was evident that a practical change in the manner of transacting the business had not been attained. Article V of the same chapter, relating to the exhibition, and all references to the exhibition, were ordered to be stricken out, thus doing away with the holding of exhibitions under the auspices of the Association.

The amendment proposed to Chapter IV, Article IV, increasing the Treasurer's salary from \$500 to \$750 was not concurred in; but at the next session the vote was reconsidered and the amendment carried.

The Council was then instructed to consider the expediency of reducing the expenses of the Association, and to report thereon as early as convenient.

An adjournment was then had to the Exhibition room, the third session to commence Thursday, at 9 A.M.

At the third session a Committee on the time and place of the next annual meeting was appointed.

A series of resolutions offered by Mr. Leo Eliel created considerable discussion, and were finally lost, apparently because of being regarded impracticable. The resolutions deprecated the mixing of remedies by manufacturing pharmacists; advised the manufacturer to present remedial agents free from admixture; declared against empiricism in all its forms; condemned the manufacture of unauthorized combinations, and the methods of forcing these upon the dispenser, as being unprofessional, unjust to the dispensing pharmacist and at variance with scientific advancement in pharmacy and in medicine; and affirmed it to be the duty of the pharmacist to meet all requirements of physicians, and never to dispense "factory-made prescriptions," unless ordered by the prescriber.

A report from the Committee to report on the unofficial formulas presented last year, offered to the Association the formulary prepared and copyrighted by the New York and Brooklyn Pharmaceutical Societies, under certain conditions. After considerable discussion the further consideration of the subject was postponed until the next session, when the offer was accepted in a somewhat modified form; accordingly the formulary will be published in the next volume of the "Proceedings," and when the necessary revision has been made, will also be published in such a form so as to place it within easy reach of all pharmacists.

A cable message was received from the British Pharmaceutical Conference,

signed by J. B. Stephenson, President, "heartily reciprocating kind greetings."

A number of papers were then read and discussed, of which brief summaries will be found below.

At the fourth session, held Friday morning September 11, the Committee appointed at the previous session reported in favor of holding the next annual meeting in the city of Providence, Rhode Island, which was adopted, amendments in favor of San Francisco and of Detroit having been negatived. The first session will be held on the afternoon of the first Tuesday of September, 1886. Mr. W. B. Blanding was elected Local Secretary, and by special resolution, also chairman of the Committee on Entertainments, with authority to appoint four associates. This Committee was instructed not to make any arrangements interfering with morning and afternoon sessions on the second and third days of the next meeting.

On motion of Mr. Colcord last years' Committee on the report on unofficial formulas was made the Committee on unofficial formulas for the ensuing year.

A Committee to visit the National Wholesale Druggists Association at its meeting to be held in Philadelphia in October, was appointed, consisting of Mr. C. A. Heinitsch, Lancaster, Pa., Charles Caspari, Jr., Baltimore, Jas. T. Shinn, Philadelphia, Charles Bullock, Philadelphia, and Jos. L. Lemberger, Lebanon, Pa.

The Committee on the President's address reported on the suggestions contained therein, recommending

1. That instead of abolishing the initiation fee, it be merged with the life membership fund.

2. That outlines of the courses of pharmaceutical studies would be useful, but their preparation and publication could not be advantageously undertaken by the Association.

3. That employers should exercise unremitting care in choosing the material for the future pharmacist by thoroughly examining each applicant desiring to enter the drug business in the branches of an English education (arithmetic, including proportions, orthography, grammar, English composition, geography and American history).

4. That the proper test of fitness of a candidate for the license of a State examining board is the State examination.

To carry out the first recommendation an amendment was offered to Article IV of the Constitution, which will be acted on at the next annual meeting.

An interesting letter to the Local Secretary, from Mr. Samuel F. Troth, dated Philadelphia, eighth month, 20th, 1885, was read. On that day sixty-nine years ago Mr. Troth entered the drug business; he is the only one living that was present at the first *suggestion* of organizing the Philadelphia College of Pharmacy in 1821, attended the first course of lectures in 1821-1822 with a class of thirty-one, was elected a member Fifth month, 22d, 1822, and of the first one hundred members only three are now living, two of the original ones, each being over ninety years of age, and himself; although in his eighty-fifth year, and retired from business for more than a quarter

of a century, he still takes great interest in pharmacy, and still prepares most of the medicines used by himself and family.

A number of papers were read and discussed, and a larger number, for want of time to read them, were referred for publication.

After passing votes of thanks to the Local Secretary and his co-laborers, to the Entertainment Committee, and to the drug trade and citizens of Pittsburg and vicinity, the thirty-third annual meeting came to a close.

The following papers were presented to the Association :

Pharmaceutical Notes, by H. T. Cummings, M. D., of Portland, Maine. *Ergot*, deprived of fixed oil by petroleum benzin, yielded a fluid extract, which retained its efficiency after standing for three years. The powdering of crude *opium* may be facilitated by washing it with benzin. *Bulky vegetable drugs*, like leaves, flowers, etc., when powdered, are thereby reduced in volume. The *specific gravity* of liquids may be taken by accurately weighing ten cubic centimeters of the same. *Water* containing organic and mineral impurities, may be purified by alum, of which 1 Gm. was in one case sufficient for two quarts of foul smelling and dark colored water taken from the bottom of a cistern.

Precipitates in Fluid Extracts, by Prof. J. U. Lloyd. This is a continuation of the researches reported in previous years. Strong solutions of seven chemical compounds were treated with strips of filtering paper to complete saturation; the remaining solution, in all instances, retained *less* of the chemical than it originally contained; but the liquid expressed from the paper, instead of being stronger than the original solution, was in all cases *weaker*. The solutions of citric acid and of ammonium carbazotate expressed from the paper were of about the same strength as the solutions left from the original ones after having been partly absorbed by the paper. Still weaker expressed solutions were obtained with berberine hydrochlorate, sulphuric acid, oxalic acid, quinine hydrochlorate and quinine bisulphate. The first portions of the expressed solution of the last named salt having formed crystals within a few minutes. Mr. Hallberg suggested that this might be due to the abstraction of sulphuric acid and the formation of the less soluble diquinine sulphate. Prof. Lloyd had found it necessary to add sulphuric acid in order to dissolve the crystallized salt in the liquid. Prof. Prescott spoke of the importance of these investigations for theoretical science, and as aiding the explanation of the true causes for the necessity of prolonged washing of precipitates and for other chemical operations.

The Preparation of Galenical Liquids from Fluid Extracts, by Prof. O. A. Wall. The author sums up his arguments by stating that tinctures and wines may be legitimately made from fluid extracts, likewise most syrups when they can be made that way, while the solutions of fluid extracts in water which generally are superior, are yet frequently so different from infusions and decoctions in strength, and occasionally in mode of action, that they cannot indiscriminately be used one for the other without the expressed consent of the prescribing physician.

Coloring Elixirs, by J. W. Caldwell, Detroit. This is advocated solely because it is required by the physician and the public. A red color from cochineal is suggested for the elixirs containing bromides, valerianates, alkaloids or chloral; a tincture made of cudbear is recommended for iodides,

arsenites, salicylates and monobromated camphor; and tincture of annatto which gives an amber tint, is regarded as suitable for the various combinations of lithium, bismuth, pepsin and strychnine, while elixirs containing cinchona alkaloids are preferably colored with caramel.

Elixir of Calisaya with Iron Salts, by E. Bocking, Wheeling. A mixture of elixir of calisaya with citrate of iron and quinine is not unfrequently prescribed and as dispensed by different pharmacists varies in color and appearance. The author finds this to be due to the manner in which the elixir is prepared, some using alkaloids for this purpose, others calisaya bark, red bark, or inferior grades of cinchona, the absence or presence of tannin, and in the latter case the varying proportions of cinchotannic acid, causing the difference in color after the addition of iron salts. The adoption of a formula by the U. S. Pharmacopœia, of elixir of calisaya is recommended.

Quinine in Elixirs, by Jos. Feil, Cleveland. By the use of quinine hydrochlorate in the place of quinine sulphate, most of the difficulties are avoided which are usually experienced in the preparation of compound elixirs of quinine, such as the elixir of quinine, strychnine and phosphate of iron. A solution of this salt, sufficient for one pint of the elixir named may be prepared by dissolving 140 grains of quinine sulphate in four fluid-ounces of hot alcohol, adding a solution of 18 or 20 grains of sodium chloride in one drachm of water, and decanting or filtering from the precipitated sodium sulphate.

Preservation of Mucilage of Acacia, by Thos. W. Watkins, Olyphant. Comparative experiments made with tolu balsam, oil of eucalyptus and oil of gaultheria show that the latter has the greatest preservative properties. The proportions used were oil of gaultheria, 15 minims; calcium phosphate sufficient, water eight ounces, acacia four ounces. Other articles, like syrup of acacia, simple syrup and lard may possibly be preserved by the addition of the same oil.

Infected Solutions, by Dr. R. G. Eccles, Brooklyn. The cryptogamous growth observed in many solutions after having been kept for some time is discussed in a lengthy paper. Regarding the effect of these plants upon health, it is contended that while they may not be the cause of disease, their irritating presence may aggravate the suffering. They may be removed by Pasteur's filter of unglazed porcelain, but not by other kinds of filters. The question as to whether these plants are algæ or fungi has not been completely settled; their structure and final development are in favor of the former view. They do not appear to be ferments; but in some solutions putrefactive bacteria are developed. Diluted phosphoric acid, thus infected, after forty days, had not decreased in specific gravity or in neutralizing power. These plants evidently live upon the carbonic acid and ammonia, derived from the air or dissolved in the liquid, and their filamentous sheaths are composed of cellulose. The plants are killed by a boiling temperature, and of the antiseptics tried, mercuric chloride was found to be the best, and about forty times stronger in its action than salicylic or benzoic acid, each of which acted as a preservative in dilutions of 1 : 2,000, or 2,500 or 3,000. The paper was accompanied by a number of microscopic drawings.

A note by Prof. L. E. Sayre, of the Kansas University, stated that phosphoric acid, in which these plants had grown for eleven months, had not decreased in acid strength, and that Dr. Formad of Philadelphia regards the plants as not being of a poisonous or deleterious character.

Assay of Tincture of Opium. Two papers were presented, by Prof. E. L. Patch, and by W. W. Bartlet, of Boston. Both authors advocate a standard strength for the tincture, the opium to contain either 14 per cent. (the official strength of denarcotized opium), or 12 per cent. of morphine (the minimum official strength of powdered opium.) The assaying should be effected by evaporating the tincture, mixing the residue with lime, and operating further, essentially in the manner directed by the Pharmacopœia for the assaying of opium.

Commercial Abstracts, by Prof. V. Coblenz, Springfield, Ohio. The abstracts of seven manufacturers were examined. *Abstractum aconiti*. The percentage of alkaloids varied in five samples, regarded as being of good quality, between 0.20 and 0.38, and fell in two to 0.012 and 0.018. Four samples of *abstractum jalapæ* reached the U. S. Pharmacopœia standard for resin in jalap root, varying between 24 and 26.3 per cent., the three remaining samples containing only between 10.4 and 17.4 per cent. Only one sample of *Abstractum nucis vomicæ* reached or exceeded the lowest alkaloidal strength of the seeds (2.74) observed by Dunstan and Short (see "Amer. Jour. Phar.," 1883, p. 468); it contained 5.96 per cent. of mixed alkaloids, while the remaining six samples varied between 1.52 and 4.62 per cent.

Liquor Ferri Nitratis, by L. Dohme, Baltimore. The present official formula yields a clear amber-colored, slightly acid liquid, which will keep an indefinite length of time, yielding upon assay 2 per cent. of ferric hydrate. To obtain uniform results the solution of tersulphate of iron and the nitric acid must both be of official strength.

Oleate of Mercury, by Prof. Emilen Painter, New York. The author's results are summed up as follows:

1. Pure oleic acid for the preparation of a 20 per cent. oleate of mercury is equal to an acid containing a small percentage of stearic acid, though not superior to it; but for the preparation of an oleate of the official strength it might preferably contain sufficient stearic acid to make it of the consistence of a soft solid.

2. Purified red oil made from good fresh fat is in every way suitable for making this oleate.

3. Very finely triturated red oxide of mercury is preferable to the yellow oxide, and no artificial heat whatever should be employed in making this preparation.

4. Oleate of mercury is best prepared by the direct union of the oxide and acid.

5. Petroleum ointment is a proper diluent for the oleate containing a less percentage of mercury than the combining proportions, and to facilitate its preparation about an equal weight of the petroleum ointment should be mixed with the oxide before the acid is added.

6. Glycerite of starch (plasma) will probably be found a suitable excipient for diluting this oleate.

7. The idea that true oleates are formed only by double decomposition is absurd; just as much of a chemical compound is formed, as by mixing a mineral acid with the base, or as is formed by making an oleate from oil and a base, the latter being the source of the oleic acid, when the oleate is made by double decomposition.

Pills of Potassium Permanganate, by Prof. E. L. Patch, Boston. The author has used resin cerate as an excipient, also kaolin with water and kaolin with petroleum. Critical experiments as to the keeping qualities have not been made, but it is thought that such pills should be freshly made when prescribed.

Mr. Sloan said that making such pills with the requisite quantity of simple cerate, and keeping them for a year, they will at once show the pure red color of permanganate solution on the addition of a drop of water. Profs. Remington and Markoe regarded the effects supposed to be due to this salt to depend upon the manganese hydrate which is formed in contact with organic matter. Mr. Finlay used Venice turpentine, and Prof. Painter employed wax as an excipient. Mr. Klie regarded compression of the salt as preferable, which Prof. Bedford suggested would act too energetically.

Pills of Silver Nitrate, by Prof. E. L. Patch, Boston. Good excipients are obtained by using lycopodium and extract of gentian, French chalk and resin cerate or kaolin and petrolatum. Mr. Sloan cautioned against the use of steel spatulas in making such pills.

Diachylon Ointment. Prof. J. M. Good, St. Louis, Mo., recommends the following as an improvement upon the officinal article: Melt together lead plaster 50 parts, petrolatum 49 parts; stir well and add oil of lavender 1 part.

Prof. Patch suggests a modification of Deringer's formula (see "Am. Jour. Phar.," 1:80, p. 473). The precipitated plaster is remelted and worked with glycerin to replace the water mechanically retained. Melt 64 parts of this plaster, add slowly 72 parts of best olive oil, and stir well while cooling, incorporating 1 part of concentrated tincture of benzoin.

Caustic Potassa in sticks. Prof. E. Goebel, Louisville, examined eight commercial samples which varied in KHO between 66.3 and 74.4 per cent.; K_2CO_3 between 6.7 and 15.8 per cent.; KCl between 0.8 and 1.1 per cent, and water between 17.6 and 22.2 per cent.

Prof. E. L. Patch examined six samples in which the variations were for KHO between 61.4 and 81 per cent., and for K_2CO_3 between 2.5 and 8.6 per cent. The other impurities, chloride, sulphate, silica and iron were examined qualitatively.

Commercial Black Antimony, by Prof. R. B. Warder, Lafayette, Ind. Of nine samples purchased in Western cities not one was genuine; hydrochloric acid dissolved a portion of each sample, usually with violent effervescence in the cold, but without evolution of H_2S , and no trace of antimony could be detected. Six samples procured in Boston, New York and Philadelphia were soluble in HCl (except a small residue) with moderate evolution of H_2S and yielding solutions containing antimony.

Commercial Tartar Emetic. Prof. Warder examined thirteen samples, which gave no indication of arsenic by Fleitmann's test, were entirely free

from iron and chlorides, and with the exception of one, also free from traces of sulphates, while eight contained traces of calcium, and two left a white residue, probably antimonious oxide, insoluble in water. The commercial salt is therefore usually nearly pure.

Commercial Calomel, by Prof. E. L. Patch, Boston. These salt from three American and one English manufacturer was examined, the four samples containing mercuric chloride in small amount, the English sample rather more than two of the American samples.

Commercial Glycerin. Three papers were presented by Profs. E. L. Patch, E. Goebel and R. B. Warder. The result of these investigators was that the samples, forty-six in all, conform very nearly to the requirements of the Pharmacopœia.

Commercial Chloroform, by Prof. P. W. Bedford, New York. Of five samples examined one reached the pharmacopœial specific gravity, 1.486, while others varied between 1.460 and 1.480. In other respects the samples came up, or very nearly so, to the pharmacopœial requirements.

Arctic Flora, by G. W. Kennedy, Pottsville, Pa. A list of thirty-two plants, most of them determined, which were gathered by Sergeant Ellison, one of the victims of the Greely Arctic Expedition.

Exportation of American Drugs, by L. A. Haber, Cleveland. For the year ending June 30, 1885, the exportation of acids was valued at \$133,582; pot and pearl ash, \$37,782; dyes and dyestuffs, \$656,148; ginseng, 377,345 lbs., \$751,168; patent or proprietary medicines, \$1,317,483; roots, barks, seeds and flowers, \$116,695; all other medicinal articles, \$1,793,328. A number of crude drugs, volatile oils and other articles which were exported are mentioned in the paper; but their quantities can only be estimated.

Dandelion and Chicory, by Jos. Feil, Cleveland. The author suggests that the Pharmacopœia should drop dandelion from the officinal list and admit chicory in place thereof, because he thinks that both are alike in their medicinal action; that, in addition to costing less, chicory is usually found in the market of good quality, and because, judging by the taste, it equals the best quality of dandelion, and is stronger than nine-tenths of that root as found in this market.

Importation of Menthol, by Prof. P. W. Bedford. This was about 4,000 lbs. in 1884, and is estimated to reach about 5,000 lbs. in the present year, and 6,000 lbs. in 1886.

The following three papers are published in full in this number: *On the medical properties of two Rhamnus barks*, by G. W. Kennedy, Pottsville; *on the oils of peppermint and spearmint*, by Prof. H. Trimble, Philadelphia, and *on commercial Spanish saffron*, by Prof. Maisch.

PICROTOXIN IN THE NIGHT-SWEATS OF PHTHISIS.—In several cases in which atropine, quinine, and ergot had proved unsuccessful, Dr. Westbrook obtained excellent results with picrotoxin. It was given by hypodermic injection in doses of one half to one milligram ($\frac{1}{150}$ to $\frac{1}{65}$ grains), gradually increased to three milligrams. It was also efficacious when given by the mouth.—*Louis. Med. News.*, June 13, 1885.

BRITISH PHARMACEUTICAL CONFERENCE.

On Tuesday, Sept. 8th, the twenty-second annual meeting of the British Pharmaceutical Conference was commenced at the appointed hour in the Hall of the Young Men's Christian Institute, Aberdeen, under the presidency of Mr. J. B. Stephenson, of Edinburgh. After the members had been welcomed to Aberdeen by the convener of the Local Committee, Mr. James Sim, and the welcome had been acknowledged on their behalf by the Chairman, the report of the Executive Committee was read by the senior Honorary General Secretary, Mr. S. Plowman. This shows that the Conference is maintaining its prosperity and extending its influence to India and the Colonies. The Treasurer, Mr. Umney, next submitted the Financial Statement, showing that the subscriptions of members during the year had exceeded £750, the balance being practically of the same amount as last year.

The President's Address, which followed, was devoted, in the first place, to a review of the true character of pharmacy and its present position in Great Britain. Taking the ground that pharmacy is essentially an integral part of medicine, having a well-defined and increasingly important character, he insisted that it could be only adequately cultivated by a class of workers devoted to its practical exercise, its chief function being indicated and defined by the word "dispensing." The recognition of this more purely professional aspect of pharmacy was gaining ground, not only with the medical profession, but with the public at large, at least in theory, however much there might still remain desirable in practice. It was, he considered, also recognized by the Legislature in the Pharmacy Act, 1868, which constituted the Pharmaceutical Society, the statutory exponent of that position. Although, however, this statutory recognition existed, it was not unaccompanied by indications of jealous regard for other interests, among which he referred to the requirement that the examiners appointed by the Council of the Society should be approved by the Privy Council, the separation of the office of examiner from that of a member of Council, and the provision for the examinations being attended by a representative of the Privy Council. Notwithstanding the jealousy thus indicated by the State, in charging itself with the responsibility involved by these requirements, he held that there was ample evidence of the true position of pharmacy being recognized by the Government of the country, so that the Pharmaceutical Society, being the recognized statutory exponent of pharmacy, it had, not only the right to regulate the examination, but had also imposed upon it the duty of taking such steps for rendering them effective as might from time to time appear necessary.

Mr. Stephenson contended that the principle involved in the requirement of pharmaceutical qualification was not only right and proper from an abstract point of view, but that it was also of great practical importance on account of the consequences that naturally followed from it and of the results which could only be hoped for by strenuously endeavoring to uphold that principle, and he proceeded to enforce this view of the matter by directing attention to several corollaries inevitably proceeding from the

fundamental proposition as to pharmaceutical qualification. As foremost among these he held that whatever pharmaceutical work was to be done it should be assigned to the pharmacist. He believed that this had been done to a great extent in Scotland, and in Edinburgh especially, much more thoroughly than it had been in the South. In consequence of the differentiation between medical practitioners and pharmacists in that city, the dispensing had for the last forty years been exclusively in the hands of pharmacists; medicine was no longer dispensed by medical practitioners for their patients, as he recollected hearing in the days of his apprenticeship had been formerly the case. Even in public dispensaries, hospitals, etc., the same change had been introduced and dispensing was no longer done supposititiously by the resident surgeon or by medical students, and in reality by a porter. In the public services, also, the principle of requiring qualified dispensers was coming into operation, and the work of compounding medicines was no longer relegated as unskilled labor to quite unqualified men. It was only by the extended application of this principle that it would be possible to do away with practices at variance with the true character of pharmacy, such as guessing quantities instead of weighing, and substituting one thing for another as convenience required, practices which were freely indulged in during the old days he referred to, and were probably not everywhere abandoned at the present time. Another result, considered to be naturally and inevitably deducible from the proposition above stated, was that the executive body of the Society, which was the recognized statutory exponent of British pharmacy, should have a considerable share in the compilation of the book whose very name indicated that it related to the preparation of drugs. The share taken in this work should be by right and not by favor, and whenever the question was opened it could only be settled in one way. The subject, he said, was referred to, not so much for the sake of argument as for the sake of reference to Scottish procedure in past time, when Scotland was under the authority of the Edinburgh Pharmacopœia, as England and Ireland were under those of London and Dublin. In those days, Sir Robert Christison—himself a master in pharmacy, as few medical men are or require to be now—fully recognized the right of pharmacists to take part in the compilation of the national pharmacopœia and he practically gave effect to that recognition by requesting the Scottish members of the Pharmaceutical Society to appoint representatives to sit on the Pharmacopœia Committee of the Medical Council, constituted for the purpose of assisting in the compilation of the British Pharmacopœia. That happened when the Pharmaceutical Society was only *de facto* the exponent of pharmacy, and now that it was *de jure* its exponent, there was still greater reason for the same course being taken consistently with the legitimate claims of pharmacy. A third corollary to be drawn from the proposition above stated had reference to the remuneration of the pharmacist and though he had some delicacy in referring to this point it certainly might be treated as a strictly professional subject. If pharmacy were in any degree a professional pursuit, it should to that extent be remunerated on a professional basis. Intrinsic value was, indeed, a very important factor in the details of a pharmacist's business; but, notwithstanding the dual nature of his calling, intrinsic value was not

the more important factor in the matter, his professional service rendered in dispensing and other parts of his avocation was to be regarded as the true standard of value. It was necessary to consider the qualification of the pharmacist, his competence to verify the purity and potency of every article he deals with, the intelligence and skill implied in this competence, the responsibility involved in the exercise of his functions, a responsibility to be measured by the momentous consequences which might ensue from any inadvertence, not only of himself, but of any agent employed by him, which involved personal attention unknown and uncalled for in any other business, together with the many other qualities, both of head and hand, necessary to constitute a true pharmacist. Considering all these points, the question of intrinsic value sank completely into the shade. The question how to apply the principle of professional remuneration was more difficult. In other professions the range of professional service was more uniform and limited, and the scale of remuneration was consequently more easily understood. In the practice of pharmacy the range of service was wider and multifarious; there might be endless discrepancy of opinions amongst pharmacists themselves as to its value, and the public would still less readily understand paying money and receiving something tangible for it as being a transaction exactly like paying a doctor or a lawyer. The problem was intricate, to be solved only by acting on the principle enunciated and making a fair estimate of the intangible elements in their transactions, namely, the intelligence, skill, responsibility and special knowledge required independently of the value of the materials dealt with. By concerted action on that principle the results would be more satisfactory to pharmacists and not disadvantageous to the public. The practice of working on such a principle had come into operation since the earlier years of his experience; it had its origin in Edinburgh, and, as far as he knew, it had afforded entire satisfaction. The President referred to another matter which he regarded as a legitimate inference to be drawn from his premises, that the qualification of the pharmacist should cover all his dealings with legal poisons, independent of all other restrictive regulations. What more was necessary than the ascertained qualification of those authorized to deal with poisons? Poisoning by inadvertence could never be prevented by Act of Parliament, any more than intentional poisoning. By the qualified pharmacist labeling would be done without the present restrictions; nevertheless these did no actual harm, and he would urge that all poisons, however sold, whether covered with the Government stamp or not, should come under their operation. Still the qualification of the pharmacist was the only real security against preventible poisoning which the Legislature was called upon to take. It had already charged itself with that, and any further legislation on grandmotherly lines would be as much out of place now as the pharmacy of the days of Romeo or the apothecary of Mantua himself would be. Still another inference, drawn from the President's initial proposition, was the need of discountenancing quackery in every shape or form, as the outcome of ignorance, cupidity and credulity. It found a congenial soil on the field of medicine, and especially that part of it occupied by pharmacy; one of its most mischievous results being to give rise to exaggerated notions as to

the true value of remedial agents. Before concluding his address, the President directed the attention of the meeting to some of the alterations and other features of novelty in the *British Pharmacopœia* just issued.

At the conclusion of the President's address the usual vote of thanks was passed, and the reading of papers was commenced, the first paper taken being a "Report on the Assay of *Atropa Belladonna*," by Professor Wyndham Dunstan and Mr. Ransom. The second was a report on an allied subject by the same authors. Owing to the nature of the room in which the first meeting was held, the reading of these papers was very imperfectly heard, and what discussion followed took a direction rather different from that in which the authors dealt with the subject. Regret was expressed by the President and others that Professor Dunstan was not present to take part in the discussion and that members of the Conference were thus deprived of the opportunity of congratulating him on his recent appointment. Incidentally the President also remarked that it seemed to be unfortunate that the extract of belladonna leaves had been omitted from the *British Pharmacopœia*, since the alcoholic extract of the root would not furnish a plaster of the same character as that which had hitherto been used, and Mr. Umney also expressed surprise at the change. Mr. Martindale said he had found a plaster made from extract of the root to meet approval, but that with the green extract he had obtained a dirty discolored plaster. Mr. St. Dalmas suggested that this result might have been due to the use of an extract of German origin. Mr. Borland also disapproved of the omission of the extract of the leaves, inasmuch as the public would still continue to require the "green plaster" to which it had been accustomed.

The next paper was on "Cotton-seed Oil," by Mr. Gilmour, pointing out the possible pharmaceutical applicability of this oil, on account of its cheapness and bland character. The author described several kinds of this oil obtained from different sources. One peculiarity of the oil, mentioned as interesting from a pharmaceutical point of view, was its difficult saponification by lime or ammonia, though when mixed with a small proportion of olive oil it readily formed an emulsion that was permanent.

"Eucalyptus Oil" was the subject of the next paper, by Mr. MacEwan; and the occurrence of several different varieties in commerce was pointed out, with some suggestions as to the sources from which they were derived, and the desirability of further investigation in order to define the character that the oil ought to possess. The paper was opportune, as pointed out by Mr. Umney, since the oil has now been made official, and there is need of its being better known.

In a "Report on Pressed Ergot," read by Mr. Moss, and describing some experiments carried out at the suggestion of Mr. Groves, it was shown that by expressing the fixed oil ergot could be reduced to a cake that was less liable to attacks of insects and alteration by atmospheric influence than ergot in its normal condition. A liquid extract prepared from this pressed ergot had been employed medicinally and found to be as efficacious as that made from ergot in the ordinary way.

Mr. Dott read a series of "Laboratory Notes," pointing out the extreme variability of commercial caustic soda, and the volatility of mercuric chloride and of iodoform; also on berberine sulphate and tests for apomorphine.

Incidentally to the latter subject he pointed out the improbability of the suggestion made by Hager that apomorphine might be formed by keeping for a long time a solution of morphine hydrochlorate.

The next paper, by Mr. Maben, on "*Santolina Chamaecyparissus*," referred to the use of this herb as an anthelmintic and gave an analysis, which did not, however, throw any light upon its supposed therapeutic efficacy, which in the course of discussion was referred by Mr. MacEwan to theological influences.

In a paper by Mr. Moss on "Natural Camphor Oil," describing his attempts to obtain a further elucidation of the nature of Japan camphor oil, the chief feature was that he did not accept the conclusion arrived at by Mr. MacEwan (see "*Amer. Jour. Phar.*," 1885, p. 406). Some results were given which tended to show the necessity of a more thorough investigation of the subject. The discussion which followed pointed in the same direction.

"Sublimated Serum and Sublimated Albumen" was the somewhat perverted title of a paper read by Mr. Jones, of Coventry, describing his experiences in the preparation of surgical dressings according to the method suggested by Sir Joseph Lister. This form of surgical dressing does not appear to have been so successful in practice as might have been anticipated, and according to a statement by Mr. Martindale it has been abandoned by Sir Joseph, who is now endeavoring to obtain another means of neutralizing the action of corrosive sublimate as a local irritant without affecting its antiseptic qualities. In the consequent discussion it was suggested by the President that the use of albumen copiously as an antidote in cases of poisoning by corrosive sublimate might be inconsistent with the fact that the coagulated compound of albumen with corrosive sublimate is soluble in excess of albumen. This suggestion, however, indicated a disregard of the direction that the stomach pump should be used immediately after the administration of the antidote. Another paper by the same author described his microscopic observations in reference to a case of cattle poisoning with *Enanthæ crocata*.

Some notes on "Sulphate of Quinine," by Mr. R. H. Davies, described the endeavors he had made to satisfy himself as to the means by which pure sulphate of quinine was to be obtained, and as to the characters that such a salt would possess. It appeared that by recrystallization of commercial sulphate of quinine from water, Mr. Davies failed to obtain a pure salt in less than five operations. But as the character of the material operated upon was unknown, or not stated, no conclusion of any value can be drawn from that experience. Mr. Davies' subsequent endeavors to ascertain by the optical method the nature of the recrystallization products did not furnish him with satisfactory results, but induced him to conclude that the datum given by Dr. Hesse as to the specific rotation of pure sulphate of quinine was incorrect, and that it was probable that what Dr. Hesse has regarded as nearly pure sulphate of quinine really contains about four or five per cent. of cinchonidine sulphate, as stated by De Vrij, Koppeschaar, and others. In the absence of any decisive evidence in contradiction of facts that have long been accepted as well established there was of course

no opportunity for a profitable discussion of the subject brought forward by Mr. Davies.

The time for adjournment having now arrived, the President stated that he had just had placed in his hands, by Dr. Paul, a print of the International Pharmacopœia, which he understood had been adopted by the International Pharmaceutical Congress assembled at Brussels last week, and he called upon Dr. Paul to report what had taken place in regard to it. Dr. Paul then stated that the document he had placed in the President's hands was the result which had been so far obtained in the work undertaken four years ago when the International Pharmaceutical Congress was held in London. On that occasion a Commission consisting of the representatives of various nationalities was appointed and charged with the duty of preparing a draft of an International Pharmacopœia upon the lines that had been agreed to at the Congress. That work had been carried out in the interim by Mr. von Waldheim, President of the Commission, who had by correspondence ascertained the views of other members of the Commission as to the preparations that should be included in an International Pharmacopœia. These views had been embodied in the printed document handed to the President, and at the meeting of the Congress in Brussels last Saturday the adoption of the International Pharmacopœia thus drawn up had been decided upon, a resolution having been adopted that the work should be edited and published as soon as possible. It was not to be supposed that this International Pharmacopœia had any further purpose at present beyond serving as a guide for those who were willing to be guided in the direction of obtaining international uniformity of potent medicinal preparations. It was to be hoped, however, that the opportunity thus afforded would be taken advantage of, and as an indication that this would be done he might mention that Mr. von Waldheim, speaking as the official representative of the Austrian Government, had stated that the Pharmacopœia authorities of that country intended to adopt the decisions arrived at by the Congress, and with that object had in the meantime withheld the new issue of the Austrian Pharmacopœia now under revision. There was, therefore, now a distinct prospect of the work done by the International Congress in London bearing some useful fruit.

The first paper read at the meeting on the following day was on "The Presence of Metallic Impurities in Materials employed for the Manufacture of Aerated Waters," by Mr. W. J. Macadam, showing the presence of lead in sugar, citric acid, tartaric acid, and essence of lemon, and suggesting the desirability of the perfect elimination of such impurity. In the discussion that followed, Mr. Umney, Mr. MacEwan and others deprecated the creation of another scare upon this subject and expressed the opinion that it had been exhausted some years ago, with the result that the quantity of impurity thus likely to be introduced into aerated water would be quite infinitesimal. Mr. Allen, however, on the other hand, considered that the habitual use of water containing a very minute quantity of lead might produce ill effects in certain peculiar constitutions.

Mr. A. H. Jackson next read a paper on "Analyses of Tartar Emetic," giving results which appeared somewhat alarming from the amount of impurity indicated. In the discussion of this paper Mr. Macadam stated

that he had not found tartar emetic adulterated during many years' experience, and Mr. Unney suggested that the samples examined by Mr. Jackson were not real tartar emetic, but a similar preparation lately introduced for use in calico printing, which was in fact a double oxalate of antimony and potash. Mr. Williams gave further information as to the use of this new compound in calico printing, and Mr. Allen was of opinion that a mistake had been made by the author of the paper as to the substance examined.

A paper was then read of Mr. A. H. Allen on "The Alteration of Spirit of Nitrous Ether." This afforded opportunity for exhibiting to the members the very elegant and efficient apparatus devised by Mr. Allen for the estimation of ethyl nitrite, though, in other respects it did not contain, as was pointed out by Mr. MacEwan, much that had not already been published. Another paper by the same author dealt with "The Assay of Amyl Nitrite," and pointed to the probability of the nature of the article met with under this name being of a variable character.

A note by Mr. J. Williams upon the same subject, detailed the results of his experience in the manufacture of amyl nitrite.

In the discussion following the reading of these three papers, Mr. Unney concurred with the opinion that the dilution of sweet spirits of nitre promoted the decomposition of the ethyl nitrite contained in sweet spirit of nitre, and he therefore suggested pharmacists would do well to adopt the gravity of 0.840 for spiritus ætheris nitrosi. The editors of the Pharmacopœia seemed to be disposed to bring the density nearer to that point than it was in the last edition; he was, however, of opinion that starting the distillation with alcohol of sp. gr. 0.838 and nitric and sulphuric acids both containing water, it would be impracticable to obtain a product having that specific gravity.

The paper on "Solution of Ferrous Iodide," by Mr. Robinson, suggested the use of hypophosphorous acid as a means of making this preparation permanent. Some doubts were suggested by Mr. Williams as to the propriety of such a course, but in any case it has been adopted by some manufacturers for several years past.

This paper was the last of those read by the respective authors, and summaries of the succeeding ones were read by the Senior Hon. Gen. Secretary. These were on "The Comparative Strength of Certain Preparations of Ipecacuanha," by Mr. W. A. H. Naylor; "The Quinological Work of the Madras Cinchona Plantations," by Mr. Hooper; "Carmine," by Mr. Dechan; "Ferrum Tartaratum," by Mr. Wright; "Occurrence of Hydrocyanic Acid as a Fermentation Product of Linseed Meal," by Mr. W. F. Senior; "The Determination and Separation of Magnesium and Calcium," by Messrs. A. and L. Siebold; "Insoluble Phosphates," by Mr. Burnett; and "Spurious Cubebs," by Messrs. Elborne and Wilson. It is to be regretted that authors contributing papers to the Conference are not always present to read them, since the discussions to which they might give rise are less likely to be adequately carried out in their absence, and thus a great part of the advantage to be gained from their communications may probably be sacrificed. It might be suggested to the officials of the Conference that they might do well to require the presence of the authors of papers

accepted for reading, or at least of some representative who would act on their behalf.

At the conclusion of the reading of papers the usual votes of thanks were passed, and an invitation conveyed by Mr. Barclay that the Conference should next year meet in Birmingham was accepted by the members, Mr. Umney remarking that after their relaxation in Aberdeen they might appropriately undergo a screwing up in Birmingham. During these proceedings the balloting papers had been distributed, and the Auditors now announced that the list of officers proposed by the Executive had been unanimously adopted, Mr. Thomas Greenish being elected the President for the ensuing year. The following is the complete list :

President.—Thomas Greenish, F.C.S., F.R.M.S., London.

Vice-Presidents.—F. Baden Benger, F.C.S., Manchester ; M. Carteighe, F.I.C., F.C.S., London ; C. Ekin, F.C.S., London ; T. Barclay, Birmingham.

Treasurer—C. Umney, F.I.C., F.C.S., London.

Honorary General Secretaries.—S. Plowman, F.I.C., M.R.C.S., London ; J. C. Thresh, D. Sc., F.C.S., Buxton.

Other Members of Executive Committee.—S. R. Atkins, Salisbury ; T. Maben, Hawick ; J. E. Brunner, M.A., Dublin ; W. Hills, F.C.S., London ; D. B. Dott, F.R.S.E., Edinburgh ; J. P. Kay, Aberdeen ; W. A. H. Naylor, F.C.S., London ; G. E. Perry, Birmingham ; W. H. Symons, F.C.S., F.R.M.S., London.

Local Secretary.—Charles Thompson, Birmingham.

Auditors.—J. Paterson, Aberdeen ; C. J. Arblaster, Birmingham.

On Tuesday evening the members of the Conference were entertained at dinner by the Aberdeen and North of Scotland Society of Chemists and Druggists in the Palace Hotel. The proceedings were marked by characteristic Aberdonian conviviality, and were extended to an advanced hour on the following morning. Visits to many of the factories and other industrial establishments in the neighborhood were organized and carried out under the superintendence of various members of the Local Committee during the progress of the meeting. An excursion up the Valley of the Dee had been arranged for Thursday, and the morning being fine a numerous party proceeded by train to Ballater and thence drove past Balmoral to Braemar, where they were hospitably entertained at lunch by the Aberdeen and North of Scotland Chemists and Druggists' Association. The arrangements of this charming excursion were well planned and admirably carried out to the end.—*Phar. Jour. and Trans.*, Sept. 12, 1885.

THE HYPODERMIC ADMINISTRATION OF IODIDE OF SODIUM.—Arcari ("Gazz. Med. Ital. Lombard.") has frequently resorted to this method of administering the iodide in cases of syphilis in which its administration by the mouth was impracticable ; if thirty grains are given by the mouth and twenty subcutaneously, the result will be the same as if ninety grains had been given by the mouth. No local disturbances are caused by the injections.—*N. Y. Med. Jour.*, May 9, 1885.

GERMAN APOTHECARIES ASSOCIATION.

The fourteenth meeting was held in Königsberg, the chair being occupied by Dr. Brunnengraber, of Rostock. Addresses of welcome were delivered by Mayor Selke on behalf of the city, and by Mr. Pakheiser on behalf of the local pharmacists. The President's address gave a condensed account of the affairs of the Association and the transactions of its Executive Board; the membership was 2,783, including 15 honorary and 10 associate members; a petition to the different authorities for permitting proprietors, having no qualified assistant, to take one apprentice for instruction had not yet received the attention of all the authorities addressed; the dispensing by homœopaths and the general tariff for the dispensing of medicines had likewise not reached a final settlement; Mr. Schlickum had been elected chairman of the pharmacopœial commission in place of Mr. Vulpius, resigned.

Prof. Dr. Lossen delivered a discourse on the life and labors of Carl W. Scheele.

Several changes in the organization of district societies were readily proposed of, after which a proposition was discussed at considerable length, contemplating the creation of a permanent commission for the purpose of communicating the resolutions of the Society to the Government; of considering the creation of an Advisory Board of Pharmacists and more particularly for elaborating a general uniform regulation for the practice of pharmacy in the German empire. The proposition was not concurred in, the executive board (Vorstand) having full power to carry out these measures.

The proposition of the executive board to establish a pharmaceutical gazette, as the official organ of the Society, was adopted. The "*Archiv der Pharmacie*," which remains the scientific journal, formerly required an annual contribution of nearly \$4,000, but at present yields annually a surplus of somewhat over \$500.

The funds in the hands of the Society now amount to 304,753.31 marks (over \$73,000). At the preceding annual meeting held in Dresden, the exhibition held under the auspices of the Association had yielded a surplus of 1,083 marks (\$260). In the future the Society will pay all legitimate expenses of the annual meetings, but will not be responsible for expenses incurred for the exhibition or for entertainments.

An interesting lecture was delivered by Professor Chun, of Königsberg, on the "*Physical Influences of the Sea*," and on the "*Relations and Dependence of the Animal World on the Conditions of the Sea*;" the lecture being based upon the observations made by Prof. Chun at and near Naples during the past ten years.

After the re-election of Dr. Schacht, of Berlin, and Dr. Leube, of Ulm, as members of the Executive Board, various reports were read and disposed of, and the Association adjourned to meet next year in Dusseldorf.

SIXTH INTERNATIONAL PHARMACEUTICAL CONGRESS.

On the afternoon of Monday, August 31st, a *séance solennelle* was held in the Palais des Académies, in Brussels, and the Congress was formally opened by Prince Caraman-Chimay, Minister of Foreign Affairs, acting on behalf of the King of Belgium, in the presence of various representatives of the State and of the city. About twenty countries were represented by delegates. Mr. Van Bastelaer, the President of the Provisional Committee, addressed the Congress, and the Secretary, Mr. Van de Vyvere, after reading the names of honorary officers and honorary members of the Congress, gave an account of the preliminary work accomplished. On motion of Dr. Méhu, of Paris, the Provisional Committee was elected the executive body of the Congress. Vice-Presidents were selected from the different nationalities, Secretaries for the four sections were appointed, and the general regulations for the conduct of business were approved. In the evening an official reception by the municipal authorities at the Hotel de Ville was tendered to the members and their ladies.

Tuesday morning, September 1st, was devoted to work in the sections.

In the first section, Mr. Verhassel presiding, Mr. Berquier reported on *veterinary pharmacy*, and a resolution was adopted declaring that the dispensing of veterinary medicines, for which the most powerful drugs are employed, should be regulated by legislative enactments. Dr. Quinlan read a paper on the necessity for an *International Pharmacopœia* from a medical point of view, which was ordered to be published. Reports on *Pharmaceutical Apprenticeship* were read by Mr. Heger for the Vienna Pharmaceutical Society, and by Mr. Patrouillard, of Gisors. Mr. Bertault discussed the subject of *Assurance Societies* by Pharmacists.

Mr. Cornelis presided over the second section, in which papers were read by Mr. Böttger, of Bunzlau, on the *sale of patent medicines*; by Dr. Méhu on the *solubility of mercuric iodide in fats*, and by Mr. Zanni, of Constantinople, on *pharmaceutical specialties*. This subject created an animated discussion, but its consideration, like that introduced by Mr. Böttger, was finally postponed.

The third section, under the presidency of Mr. Belval, was devoted to sanitary subjects. The danger attending the use of *lead pipes for water supply* introduced by Mr. Hamon, of Boulogne, led to considerable discussion, involving also the effects of poisonous metals and salts when used for domestic purposes. It was deemed proper that the use of lead pipes should be prohibited, in case the composition of the potable water should be of such a nature as to dissolve lead; and that caution should be exercised in the use of lead-glazed pots, in the cleaning of bottles by means of shot, and in the coloring of articles of food by copper pigments, etc.

In the fourth section, presided over by Van Bastelaer, Mr. Madsen, of Copenhagen, spoke on the restrictions for lessening the evils of the *immoderate use of opium*, contending that the sale of opiates should be restricted to pharmacies, and that prescriptions containing morphine should not be renewed. The subject was postponed for the present, when Mr. Patrouil-

lard discussed the advantages to the pharmacist of making as many as possible of the pharmaceutical preparations and chemicals.

At the first general session, held Tuesday afternoon, Mr. Belval reported on *food adulteration*, and after considerable discussion the following resolutions were adopted :

1. Legislation concerning adulteration should be made the subject of international agreement.

2. A legal definition of adulteration should be established.

3. (a) The offence of the adulteration of food or drink should be clearly specified by law. (b) The authorities should have the power and means of action for detecting and proving adulterations. (c) Adequate means for repressing adulteration should be provided.

4. In each country the health officers should draw up instructions defining the composition of food and drink, and these instructions should form the foundation for an international agreement upon identical data for substances of international interest.

5. The manufacture and commerce of food and drink should be under the supervision of qualified inspectors.

6. A sufficient number of analytical laboratories should be established for the purposes indicated.

7. The central sanitary officers in different countries should keep themselves mutually informed of the results arrived at by the national services of inspection and analysis.

On Tuesday evening the members of the Congress attended a meeting of the Pharmaceutical Society of Brussels, in the University, where they were welcomed by the President, Mr. Crêteur, and where a number of honorary and associate members were proclaimed. A concert and conversation at the Hôtel Mengelle was tendered by the Society on the same evening.

The sessions of the sections were resumed on Wednesday morning, September 2d, the principal interest being centered in the second section and in the discussion on *pharmaceutical specialties*, which had been postponed from the preceding day. A resolution was finally adopted by a large majority of the members present, recommending that the various Governments should be petitioned to take measures for the suppression of all proprietary medicines.

At the second general session, held in the afternoon, the action on the adulteration of food was completed, as reported above, and the subject of *pharmaceutical education* was introduced by a report by Mr. D. Nobelet, accompanied by a succinct account of the systems of education in different countries. Professor Dragendorff and Dr. Brunnengraber took part in the discussion, and addressed the Congress in the German language, when it was found that no provision had been made for competent interpreters. The recommendations adopted were as follows :

1. In all countries where it is not already the case a diploma should be established giving the exclusive right to practise pharmacy.

2. Pharmacists should pass through the same preparatory course of study as doctors of medicine and of science.

3. The minimum of knowledge required of pharmacists should be defined.

4. The title of "doctor of pharmacy" should replace other titles now in use.

5. In the absence of the proprietor the business should be conducted by a person possessing the diploma of "candidate" or "assistant."

6. As a subsidiary object, the number of pharmacies should be limited proportional to the population.

In the evening the General Pharmaceutical Association of Belgium entertained the members of the Congress and their ladies by a garden party and concert in the Bois de la Canibre.

On Thursday, September 3, an excursion was had to the city of Ghent, where the Pharmaceutical Association of East Flanders held a meeting and elected a number of honorary members; subsequently different places of interest were visited.

On Friday, September 4, the business of the sections was resumed. In the first section, Mr. Petit presiding, the reports on the regulation of the practice of pharmacy by Mr. Bratimos, and on *pharmaceutical legislation*, made in the name of the Pharmaceutical Society of Athens, were discussed, and a resolution was adopted that the public interests required the limitation of the number of pharmacies. In the third section, Mr. Belval, president, Mr. Van Hamel Roos, of Amsterdam, reported on the *adulteration of food*, and a resolution was carried favoring the publication of an international journal devoted to this subject. Papers on the plastering of wines, on alimentary waters, on the purification of waters by filtration, etc., were read, and the business of the section was closed. The second and fourth sections had combined, Prof. De Nobele, of Ghent, in the chair, discussed the suppression of the trade in *proprietary medicines*, listened to papers by Mr. Limousin and Mr. Lotze, and adopted a resolution offered by Mr. Von Waldheim declaring the pharmacist to be justified in *repeating any prescription* except where the physician has given written directions to the contrary. The sections then closed their sessions.

At the third general session, held in the afternoon of Friday, the Executive Committee of the Congress was charged with the duty of carrying out such measures relating to pharmaceutical education which had been approved by the Congress. The subject of *alimentary waters* was then taken up, and the discussion continued at the fourth general session on Saturday morning, September 5, when the conclusions were adopted formulated by Mr. Van de Vyvere in his lengthy report on "Alimentary waters," to indicate the characters of a potable water. These conclusions are as follows:

1. Potable water should be limpid, transparent, colorless, inodorous and free from suspended matters.

2. It should be cool, of an agreeable taste, its temperature should not vary materially and should not rise above 15° C.

3. It should be aerated, and contain a certain quantity of carbonic acid in solution; the air contained in it should consist of 30 to 33 per cent. of oxygen.

4. It should contain neither animal nor vegetable matters of noisome qualities, and particularly no substances in a state of decomposition.

5. The quantity of organic matter should not exceed 20 Mgm. in the liter, estimated as oxalic acid.

6. The nitrogenated organic matter, boiled with an alkaline solution of potassium permanganate should not yield over 0.1 Mgm. of albuminoid nitrogen per liter.

7. It should not contain over 0.5 Mgm. of ammonia in the liter.

8. One liter of water should not contain over 0.5 Gms. of mineral salts, or 60 Mgm. sulphuric anhydride, 8 Mgm. chlorine, 2 Mgm. nitric anhydride, 200 Mgm. alkaline earths, 30 Mgm. silica and 3 Mgm. iron.

9. Potable water should be free from nitrites, phosphates, sulphuretted hydrogen, sulphides, and from salts of metals precipitable by sulphydric acid or ammoniac sulphhydrate with the exception of a trace of iron, aluminum or manganese.

10. It should not acquire a disagreeable odor after having been kept in an open or closed vessel.

11. It should dissolve soap without forming grumes, and vegetables (les légumes) should become well cooked in it; its hydrotimetric titre should not exceed 60°.

12. It should not contain saprophytes, leptotrix, leptomites, hypheotrix or other white algæ, nor many infusoria and bacteria.

13. A fungaceous growth should not be developed after the addition of white sugar.

14. In the presence of gelatin, innumerable bacteria should not be produced liquefying the gelatin in less than eight days.

The *International Pharmacopœia* which had been prepared by Mr. Von Waldheim, after conferring with the Commission appointed by the Pharmaceutical Congress in London in 1881, was next taken up for consideration, and the work was approved and ordered to be edited and published as soon as possible, the expenses involved to be born proportionally by the several countries represented on the Commission. In a subsequent number of the JOURNAL we shall give a somewhat detailed account of this work.

The closing session was held in the afternoon when the minutes of the general sessions and of the sections were read, and the city of Milan was selected for holding the seventh International Pharmaceutical Congress in the year 1888.

On Saturday evening a subscription banquet was held in the new Bourse, and on the following day an excursion was had to Antwerp where a reception was tendered to the members by the Pharmaceutical Society of that city, followed by an excursion on the river Scheldt.

CARBOLIZED RESIN FOR INGROWING TOE-NAILS.—Dr. Genese ("Maryland Med. Jour.," "Therap. Gaz.") recommends this simple method of treatment. Pure carbolic acid and French pine resin are the components of the mixture, of which a single drop is applied to the painful spot; after two or three applications the toe-nail may be raised without pain.

THE AMERICAN JOURNAL OF PHARMACY.

NOVEMBER, 1885.

ANALYSIS OF THE ROOT OF STILLINGIA SYLVATICA, LIN.

BY WILLIAM BICHY, PH.G.

Abstract from a Thesis.

Moisture.—Two grams of powdered stillingia root were placed in a weighed porcelain crucible, and dried in a current of air at 110°C. until it ceased to lose weight. Loss, 0.31 Gm., or 15.5 per cent.

Ash.—5 Gm. of the drug were ignited at a low red heat, in a suitable vessel, until all carbon was consumed, yielding 0.25 Gm. of ash, equivalent to 5 per cent., of which 0.051 was soluble in water, 0.101 in hydrochloric acid, 0.027 in sodium hydrate, and 0.071 was insoluble.

Benzol Extract.—20 Gm. of the drug, in No. 80 powder, were moistened, placed in a percolator, and completely exhausted with benzol. The combined percolate measured 150 cc., and yielded 1.0 Gm. of extract, equivalent to 5 per cent. The extract was soft, of a reddish yellow color, and consisted of resin, fixed oil, volatile oil, and coloring matter. Water dissolved 0.15 Gm. of the extract, alcohol 0.55 Gm. (also soluble in ether and carbon disulphide), and 0.3 Gm. was insoluble in water and alcohol. The solution of the extract in water, tested for alkaloids by phosphomolybdic acid, platonic chloride and other reagents gave negative results; and when boiled with HCl, neutralized with KHO, gave negative results with Fehling's solution as a test for glucosides.

Alcohol Extract.—The stillingia treated with benzol was dried at a moderate heat and exhausted with 80 per cent. alcohol; the combined percolate measured 350 cc., and yielded 4.396 Gm. of extract, equivalent to 21.98 per cent. The extract was treated with water, and the tannin estimated with a freshly prepared solution of gelatin and alum. The precipitate weighed 5.16 Gm.; estimating 45 per cent. of this as tannin, a net result of 11.61 per cent. is shown. This tannin pro-

duced a green color with iron salts, and white precipitates with solutions of tartar emetic and morphine.

The filtrate recovered from the tannin estimate was acidulated with H_2SO_4 , mixed with an equal volume of alcohol, filtered, evaporated free of all alcohol, and the acid solution tested for alkaloids and glucosides, with results showing the latter to be absent. With phosphomolybdic acid, solution of platinic chloride and Mayer's solution precipitates were obtained. The remaining acid solution was then carefully neutralized with ammonia, and the resulting precipitate treated with 95 per cent. alcohol, which upon evaporation yielded an amorphous powder. After several unsuccessful trials to obtain an additional amount of the alkaloid the following plan was devised: The powdered drug was mixed with one-third of its weight of slaked lime and dried; the mixture was treated with alcohol until exhausted; dilute sulphuric acid was added, the liquid filtered, evaporated free from alcohol, and on neutralizing the acid solution the alkaloid was obtained. When heated it was entirely volatilized; treated with KHO , ammonia evolved; with H_2SO_4 it combines to form a sulphate, which was obtained in fine scale-like crystals. For this alkaloid I propose the name of *Stillingine*.

Cold Water Extract.—The drug, after the alcohol treatment, was macerated and percolated with cold water until exhausted; the percolate was of a straw-yellow color, yielded an extract weighing 0.55 Gm., or 2.75 per cent. It was found to be principally gum. Strong alcohol and solution of subacetate of lead produced copious precipitates.

Acid Extract.—After drying the residue of the foregoing operation it was found to weigh 10.648 Gm. It was mixed with 400 cc. of water and 10 cc. of H_2SO_4 , boiled continually for eight hours, water being occasionally added to preserve the quantity. The liquid now contained all the starch of the root as glucose; it was thrown upon a filter, and thoroughly washed with warm water until the filtrate measured 800 cc. Fehling's solution showed the presence of 4.3243 Gm. of glucose, which was formed from 3.89187 Gm. of starch. The weight of the insoluble portion after drying was 5.902 Gm.; total acid extract, therefore, 4.746 Gm., and of acid extract, not starch, 0.86413 Gm., making the total acid extract 23.73 per cent.

Alkali Extract.—The above remainder was boiled for 3 hours in 200 cc. of a 10 per cent. solution of NaOH , filtered, and washed with water to remove all alkali; the residue after drying weighed 4.592

Gm., making the alkali extract 1:31 Gm. The insoluble residue consisted of crude fibre and ash; to obtain pure cellulose it was macerated for 24 hours in a solution of chlorinated soda, washed, dried, and now weighed 4.367 Gm. This contained 0.355 Gm. of ash, leaving for pure cellulose 4.012 Gm., or 20.06 per cent.

Volatile Principles.—100 Gm. of the finely powdered drug were placed in a retort, macerated for 48 hours with water and distilled; the distillate was neutral, of a straw-yellow color, and possessed a very strong, disagreeable odor. On the surface of this distillate oil was found weighing 3.25 Gm., equivalent to 3.25 per cent. The distillate was tested for alkaloids by the usual tests with negative results.

On summing up the result of the different operations the following is produced:

	Per cent.
Moisture.....	15.50
Ash.....	5.00
Benzol extract (resin, fixed and volatile oil, coloring matter).....	5.00
Alcoholic extract (tannin, alkaloid, resin).....	21.98
Aqueous " (gum).....	2.75
Acid " (starch).....	23.73
Alkali " (coloring matter).....	6.55
Cellulose.....	20.06
Total.....	100.57

A SIMPLE METHOD OF ASSAYING CRUDE IPECAC.¹

By A. B. LYONS, M.D., DETROIT, MICH.

Complaint is frequently made of preparations of ipecac that they are deficient in strength. It not infrequently happens that a preparation of the drug is employed under circumstances which render it a matter of the utmost importance that it shall produce promptly its peculiar physiological effect. Failure may mean indeed death of the patient to whom the dose has been administered. It is obvious, therefore, that a ready means of ascertaining the quality of preparations of this drug ought to be in the hands of every pharmacist, and that it should be so simple that there could be no excuse offered for remaining in ignorance in regard to the character of preparations to be dispensed. The query I have accepted appears to have been prompted by some

¹ Read before the Michigan Pharmaceutical Association.

such considerations as these, and although in its letter it applies only to the crude drug, it is fair to assume that its spirit may cover an inquiry into the method of assaying the galenical preparations of ipecac.

Crude ipecac may be assayed in various ways according to the object proposed in the investigation. We may desire to know simply what is the medicinal activity of the root in its crude state, either expecting to employ it in the form of a powder to be given in substance, or desiring to know how to adjust the doses of the various preparations of the drug. Or we may wish to ascertain how much alkaloid we can extract from the root by a given process; our assay process in such a case would not seek to exhaust the drug, but rather to imitate on a small scale the extraction process adopted in the actual manufacture.

Before entering upon a study of these several assay processes, it may be advantageous to review the methods that have been proposed for extracting emetine from the drug.

The process of MM. Pelletier and Dumas (*Ann. Ch. Phys.* [2] xxiv, 180") is that given in most of the text books. It is given in Watts' Dictionary of Chemistry as follows: "The powder of ipecacuanha is digested in water with calcined magnesia; the deposit is thrown on a filter, washed carefully with very cold water and dried, and the emetine is then taken up by alcohol. It may then be combined with an acid, and the salt may be purified with animal charcoal." The yield is not stated. The method is one I have never tried, partly because I hesitated about exposing the alkaloid to the action of magnesia during the drying process, and partly because experience with other alkaloids does not favor the use of an aqueous menstruum in the primary extraction.

A process quite similar to this one in principle was recommended in 1875 by Glenard (*Journ. de Pharm. et Chim.* Sept. 1875"), but ether is employed as the solvent in place of alcohol—an obvious improvement, and lime is substituted for the magnesia. The process "consists in treating with ether a suitably prepared powder, or an extract of ipecacuanha and lime, or the precipitate formed upon adding an excess of lime to a solution obtained by treating ipecacuanha in the cold with water acidulated with sulphuric acid. Either of these mixtures, or the precipitate when treated with ether will yield all the alkaloid it contains." The alkaloid is removed from the ethereal solution by shaking with acidulated water, and may then be precipitated by the addition of ammonia. From this precipitate crystallizable salts may

be readily prepared, although these salts require careful manipulation to obtain them in the crystalline form. Glenard observes that ammonia does not precipitate from solutions containing an excess of (hydrochloric) acid all of the alkaloid, a portion being retained in the solution, probably in the form of a double salt of emetine and ammonia.

In 1877 MM. Lefort and Würtz published ("Journal de Pharmacie") a process involving the same general principles, but taking advantage, in the first stage of the operation, of the sparing solubility of the nitrate. "An alcoholic extract of ipecacuanha is dissolved in about its own weight of water. A cold saturated solution of potassium nitrate is added, until a precipitate ceases to fall, and the mixture is set aside 24 hours. The abundant pitchy, blackish brown deposit is washed three or four times with a small quantity of water, dissolved in a little hot alcohol, and thrown into a thick milk of lime, containing about its own weight of calcium hydrate. The mixture is evaporated to dryness on a water-bath, the mass powdered and extracted by maceration with ether."

Podwissotzky in 1880 ("Pharm. Zeitschr. für Russl.") published an improved method for preparing pure emetine, and described anew the properties of the alkaloid. His process depends on the solubility of emetine in hot petroleum benzin. He recommends to treat the powdered drug with ether, then with petroleum benzin, to remove fatty and waxy matter, to exhaust the powder with 85 per cent. alcohol employing a moderate heat, but without addition of acid, to evaporate the extract to the consistence of a syrup, and when cold add ferric chloride (10 to 13 per cent. of the weight of the drug) in concentrated aqueous solution; then having added an excess of sodium carbonate, to boil the mixture with several successive portions of petroleum benzin as long as alkaloid is taken up. The solution when cold deposits the alkaloid in white flakes, and the product is very pure. An alternative process is given which is much simpler. The powdered ipecacuanha is triturated to a thick paste with a little hydrochloric acid, ferric chloride added as before, then sodium carbonate, and the mixture is allowed to stand some time. It is then extracted with successive portions of ether, the alkaloid removed from the ethereal solution by acidulated water. Soda is then added in excess, and the alkaloid removed by boiling petroleum benzin, as in the first process. The author states that the best kinds of ipecacuanha yield from three-quarters to one per cent. of emetine; inferior kinds only one-quarter to one-half of one per cent.

It has seemed to the writer that this last process, which is the best yet proposed, can be still further simplified and improved, and experiments appear to warrant the recommendation of a process like the following: Mix 10 parts of the powdered ipecacuanha in a flask, or other suitable container, with an equal weight of petroleum benzin. Add a mixture of two parts of stronger water of ammonia with eight parts of alcohol; shake the mixture well and allow it to stand a short time in a warm place. [In my experiments I allowed the mixture to stand from half an hour to one hour, but I am not sure that there is any advantage in leaving it so long a time even as this.] Proceed to extract the alkaloid by boiling with successive portions of petroleum benzin, amounting in all to ten or fifteen times the weight of the drug. Filter the benzin solution while hot through paper, and treat it with water containing sulphuric acid, which readily removes the whole of the alkaloid, leaving resinous matter in the benzin. Separate the acid solution, filter if necessary to remove suspended matter, add excess of alkali (carbonate of barium, carbonate of sodium, or ammonia) and take up the alkaloid with boiling petroleum benzin, as recommended by Podwissotzky. I believe that by this method it is practicable to extract from ipecacuanha of good quality not less than two per cent. of alkaloid. The solvent used, although employed in large quantity, is a very cheap one, and the loss in manufacturing operations would be a trifling item of expense, as compared with that involved in the use of the more expensive solvents, such as alcohol, ether or chloroform.

The process, moreover, is one which can easily be employed as an assay process, which is not true of any of those previously passed in review. Its advantages for this purpose are its simplicity of execution, and the rapidity with which it can be carried out. It does not completely exhaust the drug, although it permits us to extract a larger proportion of the alkaloid than any other rapid method I have tried. By using a portion of chloroform in connection with the benzin, the process may be made to yield results, as we shall see later, reasonably satisfactory. Obviously, in any case, if our object is to ascertain, not the absolute, but the practical value for the manufacturer of a given sample of ipecac, we should be justified in making use of even an imperfect method of assay, the results of which would indicate the quantity of alkaloid we might hope to obtain from the drug.

Of the methods that have heretofore been proposed for the assay of

ipecauanha, that of Zinoffsky, recommended by Dragendorff (Werthbestimmung einiger starkwirkender Drogen) is the only one worthy of consideration. Dragendorff directs to mix the finely powdered drug with five times its weight of water containing sulphuric acid [one minim of a dilute acid 1:8, for each grain of drug], allow to macerate twenty-four hours, add alcohol, equal in weight to the water used, and continue the digestion 48 hours. An aliquot portion of the fluid is then to be evaporated to drive off the spirit, and the residue diluted with water, filtered and titrated with Mayer's reagent, of which 1 cc. precipitates 0.0189 gm. emetine.

The process is very easy of execution, and has in its favor the circumstance that it shows a larger proportion of alkaloid than any other assay process.

The time of the assay may be somewhat shortened, if the drug is employed in a very fine powder, by allowing the maceration to go on at a temperature of 50°C. (122°F.) and shaking the mixture frequently. It is not, however, easy to reduce the root to an impalpable powder, and it is better, when there is no haste, to extend the time of maceration to three or four days. The details of the process, as I am in the habit of using it, are as follows:

Place in a suitable bottle or flask 50 cc. of distilled water (without addition of acid), afterwards put in ten grams of ipecauanha in fine powder; mix, cork the bottle or flask, and set by in a warm place, shaking occasionally. At the end of twenty-four hours add to the mixture 52 cc. of alcohol, making a total of 100 cc. of menstruum owing to condensation of volume; cork, and set aside again for three days, shaking well several times a day. Then measure out with a pipette for the assay 25 cc. of the clear fluid, which will represent as nearly as possible $2\frac{1}{2}$ grams of drug. Put this in a capsule, add 5 drops of a highly dilute sulphuric acid (containing 6 per cent. H_2SO_4), evaporate at a gentle heat until all the alcohol is driven off, add water to make up to the original measure of 25 cc., digest a few minutes on the water bath, allow the mixture to cool, and proceed, without filtering, to titrate with Mayer's reagent. [Filtration appears to involve a needless expenditure of time, observation showing that it does not affect the result.]

The solution employed for the titration may conveniently be made of one-half the strength of Mayer's reagent. One litre will contain therefore 6.773 grams corrosive sublimate and 25. grams potassium

iodide. Add of this reagent two or three cc. at first, and filter. As soon as a sufficient quantity of clear filtrate has run through (5 to 10 cc.) add to this a few drops of the reagent, and if a copious precipitate is produced, add about 1 cc. and immediately return the mixture to the filter. The first portion of filtrate (10–15 cc.) that passes after this has been done must be returned also, but the succeeding portion is to be tested again with Mayer's reagent. As soon as the precipitation ceases to be copious, the reagent is to be added only 0.1 cc. at a time, and nearly the whole of the fluid allowed to pass through the filter before testing again. Filtration is generally rapid, so that the entire operation consumes but a short time, and it is easy to carry on several titrations at once, where a series of assays are to be made. The time actually occupied in such an assay is scarcely more than half an hour, and the manipulations require no especial skill. The result is easily calculated, by merely multiplying the number of cc. of reagent consumed by 0.378, the product expressing the percentage of emetin in the drug. It is customary to calculate the result upon the dry drug, but for commercial purposes there is no advantage in doing this. It is easy, however, to obtain the corrected figure, if at the same time that the powder is weighed for the assay, a second portion of one gram is also weighed for estimation of moisture. This is to be dried at a temperature not exceeding 105°C. (221°F.), as long as it continues to lose weight. In this way, it will be found that the powder generally contains 5 to 8 per cent. of moisture.

Suppose the drug to have contained 6.5 per cent. moisture, and to have indicated in the assay 2.4 per cent. emetine. The corrected per cent. will be found by solving the proportion $100-6.5:100::2.4:x$, and will be, therefore, $2.4 \div .935 = 2.57$ per cent.

To what extent, however, can we put confidence in these results? We find, in most cases, that results obtained by titration with Mayer's reagent vary very greatly according to the dilution of the fluid. It is therefore necessary, in order to obtain results of any value, to be careful that the proportion of alkaloid contained in the solution shall not vary materially from a fixed standard, and it is equally necessary to employ always in the assay the same proportion of free acid. It is, indeed, often necessary to make two titrations, the first merely to ascertain approximately the amount of alkaloid present in order to determine what should be the volume of the fluid to be titrated, and a third experiment even may become necessary. Emetine is, however,

an exception to the majority of alkaloids in this regard. While dilution of the fluid is not without influence on the result, this influence may be disregarded if the proportion of alkaloid in the fluid lies between 1:250 and 1:500, and such is almost invariably the case if the directions above given be followed.

The examination of the various galenical preparations of ipecac can also be readily made by Mayer's reagent. Solid extracts are to be exhausted with acidulated water, or, in case they contain much resinous matter, with acidulated alcohol, water being afterwards added and the spirit evaporated off; the aqueous fluid is to be then titrated as usual. The fluid extract presents no difficulty whatever. Dilute a portion of the fluid with water to exactly four times its original volume, and take 10 cc. of the mixture for the assay. Add 5 minims of the 6 per cent. sulphuric acid, evaporate on the water bath to drive off alcohol, make up to a volume of 15 cc., and titrate.

A more important question, however, arises, viz., does the drug contain nothing besides emetine capable of giving a precipitate with Mayer's reagent? The results of assay by the method of Dragendorff indicate the presence in ipecac root of from 2 to 3.9 per cent. of emetine. Those who have attempted to extract the alkaloid have generally reported a yield of less than one per cent., but this, as I have already intimated, is due in part, at least, to defective methods of extraction. Dragendorff, himself, admits that he was not able to extract, by means of chloroform, the entire amount of emetine shown to be present by titration with Mayer's reagent. This he attributes to loss of alkaloid through the action of the alkali employed to set it free, although in some of his experiments he used for this purpose barium carbonate, and it seems hardly possible that this should exert such an influence. By the use of Mayer's reagent he found in the drug about 3.75 per cent. of alkaloid. He was able, however, to extract by chloroform only 2.4 to 2.9 per cent., but he does not say distinctly that the same drug was employed in both cases. Others have had a similar experience. One observer only has reported identical results by the two processes, and he states that he took the precaution in the extraction with chloroform to exclude air from the flask. My own results, in a series of experiments with one sample of ipecac, seem to me to confirm Dragendorff's view, but in experimenting with another sample of the drug the discrepancy in results seemed to me greater than could possibly be accounted for by changes taking place in the alkaloid during

the very short process of extraction. That the alkaloid is an extremely sensitive one, no one who has experimented with it at all can doubt. Even after it has been isolated, it must be kept in the dark to prevent changes that would otherwise take place in it.

Incidentally, I may ask, in view of this sensitiveness of the alkaloid, what shall we think of the present U. S. P. process for making fluid extract of ipecac, with its complicated manipulation and long exposure of the product to heat.

There is no difficulty in preparing a fluid extract of ipecac with alcohol of moderate strength that will contain, by Dragendorff's mode of assay, upwards of 2 per cent. of emetine. By the U. S. P. process, a drug which assays 3 per cent. alkaloid will produce a fluid containing less than 1.5 per cent. From the first mentioned extract, similar to that which was formerly official, it is easy enough to prepare a syrup, although certainly this cannot be done by simply mixing the fluid extract with syrup; to my own mind the admission of the present formula into the U. S. P. is an unwarranted concession to slipshod pharmacy, against which we should all unite in protest.

Returning from this digression, I attack the main problem of this "query," seeking some simple method of actual assay by which the whole of the emetine may be extracted from the drug in a weighable form.

An exhaustive study of this problem would require much more time than I have been able to give it. I have made many experiments, a large number of them having no value except as indicating plans to be avoided in future. The principle to be adopted in every case in the assay of a drug of this kind, is to select such a menstruum for the exhaustion of the drug as shall extract as completely as possible its active principle and withdraw with it a minimum of inert matter. The solvent which I have found most generally useful in these assays is that employed by Prollius for extracting the alkaloids of cinchona bark. It consists of a mixture of ether 250 parts, absolute alcohol 20 parts, ammonia, stronger, 10 parts. The general mode of carrying out the assay I have elsewhere described in detail ("*Druggist's Circular*," August, 1884). As applied to the assay of ipecac it would be conducted as follows:

Place in a small flask (capacity about 50 cc.) $2\frac{1}{2}$ grams, accurately weighed, of ipecac in fine powder; select a sound cork to fit the flask, and weigh flask and cork with the contained ipecac. Fill the flask

nearly full with the mixture of ether, ammonia, and alcohol, and set aside, shaking occasionally, for twenty-four hours. Weigh the flask with its contents before removing the cork; decant as much of the clear fluid as practicable, taking care to operate rapidly to avoid evaporation. Immediately cork the flask again and weigh. You may now separate the alkaloid from the decanted portion of ether by shaking repeatedly with acid water, and again washing out from the aqueous solution, rendered alkaline, with chloroform, but identical results can be obtained more rapidly by merely evaporating the ether after addition of water containing 10 minims of 6 per cent. sulphuric acid, and titrating the aqueous solution (made up to 20 cc.) with Mayer's reagent.

The calculation of the assay is not difficult. You have as data total weight of solvent used, weight of portion of solvent with contained alkaloid, resins, etc. You may assume that the solvent has taken up in all 5 per cent. of material from the ipecac. This will amount to $2.5 \times .05 = 0.125$, to be added to the weight of the total solvent—a quantity so trifling that it may be neglected in practice—since this assay is not close enough to render important minute fractions.

Suppose the weight of the solvent to have been 40 grams, the portion decanted 26 grams, and the alkaloid obtained from this decanted fluid to have been 0.055 grams ($= 5.82$ cc. of the reagent used). Then, $26 : 40 :: 0.055 : x$, x being the quantity of alkaloid contained in the 2.5 grams of drug used. Solving the proportion, $40 \times 0.055 \div 26 = .0846$. Since the quantity of drug used was 2.5 grams, this result multiplied by 4, with the decimal points removed one place toward the right, will give the per cent. (approximately) of alkaloid in the drug, in the above example, 3.384 per cent.

The results I have obtained by this method of assay have, however, been unsatisfactorily low, and, until some of the details are a little more fully worked out, I regard it only as a plan promising well. I have substituted for the ether in this process petroleum benzin, and mixtures of chloroform and ether, the results in the former instance wholly disappointing, and in the latter not as satisfactory as where ether alone was used.

I believe that when experiment shall have determined what quantity of solvent is required, how much ammonia should be used, and how long the maceration should continue, the process will prove a good one, and it has this advantage over Dragendorff's process, that it is not liable to give results above the truth. In experiments recently made, I

obtained from the same ipecac, by Dragendorff's method, 2·64 per cent. emetine, by the same, modified as I have described in detail 2·72 per cent., by the ammoniated ether process 2·42 per cent.; by the same using a mixture of ether and chloroform 2·3 and in a second experiment 2·18 per cent.; ammonia and benzin extracted after 48 hours maceration only 1·12 per cent, and even when the maceration was carried on in a warm place the yield was only 1·32 per cent. Ammonia and boiling benzin, the process suggested for the manufacture of emetine, extracted 1·8 per cent. to 2 per cent.

Experiments made with chloroform as a solvent have given the best results yet obtained. One plan, which is both simple and rapid, is the following :

Place in a flask 5 grams of finely powdered ipecac, add a mixture of strong ammonia 1 gram, alcohol 5 grams, chloroform 30 grams. Set in a warm place half an hour, then apply sufficient heat to keep the mixture boiling for one hour ; then add 50 cc. petroleum benzin, boil half an hour, add benzin enough to make the mixture measure nearly 100 cc., filter, and add through the filter enough benzin to make 100 cc. Of this take for the assay 25 cc., and treat as in the ammoniated ether process.

From the same ipecac as that used in the former experiments I obtained in this way 2·6 per cent alkaloid.

Still another experiment has given encouraging results. By using the menstruum which Messrs. Durstan and Short have found the most suitable for exhausting *nux vomica*, I found that ipecac could be easily and quickly exhausted. This menstruum consists of a mixture of three volumes of chloroform with one of alcohol. The ipecac, 5 grams, can be placed in an extraction apparatus, and treated by hot repercolation with about 40 cc. of the mixture. The alkaloid can be removed from the chloroform by washing repeatedly with acid water, and the acid fluid can then be titrated, or the alkaloid can be removed from it by rendering it alkaline and shaking repeatedly with chloroform, dried and weighed. The method is well adapted for exact assays, and in the analytical laboratory will doubtless be preferred to any other.

For the pharmaceutical chemist the treatment with chloroform and benzin is to be recommended, being very simple, rapid, and practical, provided further experience shall demonstrate its complete trustworthiness. With regard to both of these last described processes, although I feel confident that they more nearly satisfy the requirements of the

problem in hand than any that have heretofore been proposed, I have not had the time to elaborate their details sufficiently to warrant me in declaring the problem completely solved. I trust that this contribution to the discussion of the subject will be of some service in directing future effort towards its final solution.

The practical result of my experiment has had, at any rate, this outcome, that it has given me increased confidence in the method of Dragendorff, which I have heretofore regarded with a certain amount of distrust.

In concluding this paper, I have thought it might be of interest to give a summary of some of the results of the assays I have had occasion to make of ipecac, and of its preparations, premising that their results have been obtained by the use of Dragendorff's method of assay, when not otherwise stated.

Of 48 samples of crude drug examined 5 contained less than 2 per cent. emetine (minimum 1.65 per cent.), 10 contained between 2 and 2.5 per cent., 23 between 2.5 per cent. and 3 per cent., and 10 upward of 3 per cent. The following items of description are noted in connection with some of the samples:

	Per cent.
Thin roots, nearly black.....	2.2
Flesh colored, "bold" sample.....	2.85
Flesh colored, good appearance	2.1
Thin, dark root.....	1.65
"Bold" sample (white).....	2.25
" " ".....	2.75
Pale flesh color.....	3.00
White, bold, tender roots.....	2.7
" " " woody.....	2.6
Dark colored, much broken.....	2.8

Solid extract of ipecac has ranged in content of alkaloid from 8.9 to 10.3 per cent. Powdered extract, from 6 to 7.5 per cent. Fluid extracts made by the U. S. P. process contain generally less than 1.5 per cent. Made by processes that do not involve the use of heat, the percentage is higher but does not generally exceed 2 to 2.25, and often falls short of this. The samples examined have been those of a number of manufacturing firms, and many of them are regarded as articles of excellent quality.

The time must very soon come when the alkaloidal strength of galenical preparations of all active drugs will be regulated by our official

standards. It rests largely with Associations like this one to cultivate the analytical investigations which will result first in fixing such authoritative standards, and then in securing such an education of the retail druggist as shall enable him to save the law from becoming a dead letter.

OCTOBER 8th, 1885.

PRODUCTS OF THE MEZQUITE.

BY HERMAN J. SCHUCHARD, PH.G.

Abstract from a Thesis.

On the hills surrounding San Antonio, Texas, the *Algarobia glandulosa*, *Torrey and Gray* (s. *Prosopis juliflora*, *De Cand.*), is a thorny shrub, branching directly at or a few feet above the ground; but on rich soil and under favorable conditions it becomes a tree 30 to 40 feet high. The legumes, which are somewhat constricted between the seeds, ripen in July and August, and are then yellowish white, mottled with red, four to six inches long, and contain 10 to 20 seeds. In the unripe state they are bitter, but at maturity have a sweet, pleasant taste, and have been sold by the bushel when grain was scarce in the "Alamo City." The Mexicans and Indians prepare a favorite dish from mezquite beans; after the seeds have been picked out, the pulp is ground into a coarse meal, well seasoned with "chile" (capsicum), wrapped in corn husks and boiled. The roots of the mezquite spread sideways for many yards, but others are said to dip into the ground sometimes 50 feet, thereby enabling the shrub to thrive during the hot and dry season. The wood of the mezquite is very hard, and takes a fine polish, but is usually too crooked and knotted to be used for cabinet work. It is brought to the San Antonio market by the Mexican "carrettas" and sold for fuel, for which it is unsurpassed; it is also used in fencing, and blocks of the wood have been employed to a small extent for paving sidewalks in San Antonio.

During the summer months a gum exudes from the stem and branches, which was brought into notice by Dr. Shumard, U. S. A., in 1854, and described by Prof. Procter (see "Amer. Jour. Phar.," 1855, pp. 14 and 223). The gum dissolves completely in an equal weight of water, in 24 hours, at a temperature of about 70°F., and forms a thick mucilage, of an acid reaction, which is not precipitated by subacetate of lead, or thickened to a jelly by silicates, borates or

ferric salts, but which, after acidulation with hydrochloric acid and the addition of alcohol, yields a white precipitate. The gum contains 12.6 per cent. of moisture, and on ignition leaves 2 per cent. of ash; this yields to water 26.229 per cent., containing potassium and a small amount of sodium, while hydrochloric acid dissolves 73.442 per cent., containing mainly calcium (about one-half the weight of ash), with small amounts of magnesium and aluminium. The gum is free from starch, and by boiling with hydrochloric acid is converted into glucose.

Gum mezquite does not appear to be much used at present, as the price of gum arabic is low; it is applicable to all purposes like gum arabic, though the dark-colored varieties may be objectionable in some cases. In medicine it does not only answer as well as gum arabic, but may be used with advantage occasionally, since its solution can be combined with basic lead acetate and with ferric salts without being precipitated. No doubt in time gum mezquite will become a commercial article of some importance. It is generally assorted, according to its color, into four varieties or grades.

NOTE BY THE EDITOR.—The Mexican Pharmacopœia contains some interesting information on the mezquite, supplementing that given above. The name "mezquite" is applied to *Prosopis dulcis*, *Kunth*; *P. microphylla*, *Kunth*, and *P. juliflora*, *De Cand.*; an extract is prepared from a decoction of the leaves, and this dissolved in water is known under the name of "bálsamo de mezquite," and used in various inflammations of the eye. The fruit is used as food, and by fermentation yields considerable alcohol; the colorless distillate has a peculiar odor, and when of from 50 to 60 per cent. strength is called "vino de mezquite." The gum is stated to be commonly mixed with another gum, probably obtained from *Acacia albicans*, which has a much darker color, and the solution of which is darkened by potassa, while the solution of gum mezquite is rendered white by this reagent; the distinction was ascertained by A. Morales in his comparative studies of the Mexican gums.

WINE OF COCA IN FATIGUE.—Dr. E. R. Palmer contributes to the *American Practitioner* for February an account of a physiological experiment made during a walking-match, upon the effects of coca in sustaining the system under prolonged muscular effort. The subject was a young girl of seventeen years, who was a professional pedestrian, but who was much reduced in strength by poor food and too great reliance upon alcoholic stimulants. The effect of the coca in sustaining muscular vigor were very marked. About a pint of the wine of coca was consumed. The distance traveled was three hundred and fifty miles in seven days.—*Columbus Med. Jour.*, May, 1885.

NEW METHOD OF TREATING SEA-WEED.

(Condensed from the Report on the Chemical Industries at the International Inventions Exhibition, London, 1885, by Prof. Samuel P. Sadler.)

The exhibit of Mr. E. C. C. Stanford illustrates generally the manufacture of iodine, bromine and potassium salts from sea-weed, besides that of the new and interesting substance, *Algin*, first isolated and studied by Mr. Stanford; also many of the metallic alginates. It would appear that amongst sea-weeds, the algæ possess the power of assimilating the iodine from sea-water to about ten times the extent of the bromine, and that amongst the algæ the *Laminaria* and the *Fuci* are the kelp-producing species of the order referred to. The drift-kelp is made from two varieties of red weeds, or *Laminaria*, the *L. digitata* and the *L. stenophylla*. The former is known as tangle, and both kinds are always submerged. These sea-weeds, and especially the latter, are much injured by rain, and are often after drying almost valueless. If well preserved, the *Laminariæ* contain ten times as much iodine as the *Fuci*. It furnishes the only kelp now used for making iodine. The usual yield of kelp from 100 tons of wet sea-weed is 5 tons, and, as only half of this is soluble, two and one-half tons form the total valuable product of what may be called the *native process*, and this must pay for the labor of cutting, carrying, drying and burning 100 tons of wet sea-weed. As the people in burning the weed use such a heat as to produce a sort of slaggy mass, and lose thereby about half the iodine, Mr. Stanford proposed the so-called *char-process*, by which all the iodine is saved. The weed in this process is submitted to destructive distillation in iron retorts, leaving behind a loose porous charcoal, retaining the salts and the iodine, and yielding in the distillate ammonia, acetic acid and tar. In a still newer process—in fact, the one referred to in the title of the exhibit—Mr. Stanford extracts first the potassium chloride (“muriates”), potassium sulphate and “kelp-salt” (sodium chloride containing some carbonate and including the iodides), by simple maceration in cold water. The amount so removed from the air-dried *Laminaria* is about one-third of its weight (thirty-three per cent.), of which twenty to twenty-two per cent. are mineral salts, and the balance consists of dextrin, mannite and extractive matter, leaving two-thirds of the plant (sixty-six per cent.) for further treatment apparently unaltered. This residue contains the peculiar new substance, *Algin*, and the cellulose.

The comparison between the three processes is of considerable interest, as showing the advance made upon the old kelp process, so tenaciously adhered to and persisted in by the natives of the West Coast, by Mr. Stanford's "char" and "wet" processes.

Kelp Process.

Per cent. utilized, 18.

Kelp, 18 tons.....	{ Salts, 9 tons. Iodine, 270 lbs. }	{ Residuals : kelp waste, 18 } tons. Valueless.
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Char Process.

Per cent. utilized, 36.

Char, 36 tons.....	{ Salts, 15 tons. Iodine, 600 lbs. }	{ Residuals : charcoal, 36 } tons, tar and ammonia.
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Wet Process.

Per cent. utilized, 70.

Water extract, 33 tons.	{ Salts, 20 tons. Iodine, 600 lbs. }	{ Residuals : algin 20 tons, cellulose 15 tons, dex- trin, etc. }
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In this new process, the sea-weed is to be exported and worked at a central factory, and all the common varieties can be used. The weed is first boiled with sodium carbonate, the solution is filtered and precipitated with sulphuric acid, the precipitate being the new substance, algin, which resembles albumen, and contains all the nitrogen, and, moreover, all that is nutritious in the sea-weed. The solution is now neutralized with limestone, the sulphate of lime deposited, the neutral solution evaporated down, and the sulphate of soda crystallized out. The mother-liquor, containing all the potash salts and iodine, is carbonized, forming the "kelp-substitute." The residue on the filter is the cellulose. The whole plant is thus utilized. (See table.)

Residue.	SODA SOLUTION.		
	Precipitated by sulphuric acid.	Retained in solution.	
Cellulose.	Algin.	Sulphate of soda, crystallizes out as Glauber's salt.	Mother-liquor, carbonized is kelp-substitute.

Algin has fourteen times the viscosity of starch, and thirty-seven times that of gum-arabic. Algin or sodium alginate in solution is precipitated or coagulated by alcohol, acetone and collodion, but not by ether. It is precipitated by mineral acids, various salts, and by lime and baryta water. The solution is not precipitated or coagulated

by alkalies and alkaline salts, starch, glycerol and cane-sugar. It does not precipitate the ordinary alkaloids. It is distinguished from albumen, which it most resembles, by not coagulating on heating, and from gelose by not gelatinizing on cooling, by containing nitrogen, by dissolving in weak alkaline solutions, and being insoluble in boiling water. From gelatin it is distinguished by giving no reaction with tannin; from starch, by giving no color with iodine; from dextrin, gum-arabic, tragacanth and pectin by its insolubility in dilute alcohol and dilute mineral acids.

It is remarkable that it precipitates the salts of the alkaline earths, with the exception of magnesium, and also most of the metals; but it gives no precipitate with mercuric chloride or potassium silicate.

COMMERCIAL APPLICATIONS OF ALGIN, OR SODIUM ALGINATE.

For Sizing Fabrics.—As a finish, algin has the advantage over starch that it fills the cloth better, is tougher and more elastic, that it is transparent when dry, and that it is not acted upon by acids. It imparts to the goods a thick clothly, elastic feeling, without the stiffness imparted by starch. It has the advantage possessed by no other gum of becoming insoluble in presence of a dilute acid which decomposes starch or dextrin. No other gum having anything like the viscosity of algin in solution, none will go so far in making up the solution or cover such a large surface. *The alginate of alumina* in caustic soda is a stiff dressing, and in the crude unbleached state will be a cheap dressing for dark materials, and in the colorless for finer fabrics. *The ammoniated alginate of alumina* can be used to give a glossy surface, which is quite insoluble after drying.

As a Mordant and Dung-substitute in Dyeing and Printing.—Mr. John Christie, of the firm of J. Orr Ewing & Co., states that “there is another application of the alginate of soda, viz., in the fixing of mordants such as those of alumina or iron upon cotton fibre.” Very encouraging results are said to have been obtained, and Mr. Christie believes a very large application will be found for alginate of soda as a “dung-substitute.” This being the case, the substitution of so harmless a compound for one so poisonous as the generally used arseniate of soda should be welcomed and a fair trial accorded the new dung-substitute. In Germany, where the use of poisonous materials in connection with printing and dyeing textile fabrics is greatly restricted, if not altogether interdicted, one would imagine such a substitute would

when known be readily adopted. Mr. Christie continues: "The mordants when precipitated seem to have full dyeing power," which means that as a dung-substitute the alginate has done its work well.

As an Article of Food.—Algin contains carbon, 44.39 per cent.; hydrogen, 5.47; nitrogen, 3.77; oxygen, 46.57; or about the same amount of nitrogen as is found in Dutch cheese. For thickening soups and puddings, as a substitute for gum-arabic in the manufacture of jujubes and lozenges, and in making jellies, it is said that it would be very serviceable.

In Pharmacy.—It is said that it would be useful for emulsions of oils, as an excipient for pills, and for fining of spirits.

For Boiler Incrustations.—Mr. Spiller has proved that a solution of sodium alginate forms one of the best fluids for preventing boiler incrustation, as it quickly precipitates the lime from the boiler water in a state in which it can be easily blown off.

Algie Cellulose.—This substance bleaches easily, and under pressure becomes very hard, when it can be turned and polished with facility. It makes also a good paper, tough and transparent, but with no fibre. Alone, or mixed with algin and linseed oil, or shellac, it may be used as a non-conductor of electricity where a cheap material is needed.

The Sea-weed Charcoal.—It is proposed to use this in conjunction with algin for covering boilers, and such a composition has been largely applied under the name of "carbon cement." This is nearly all charcoal, three per cent. of the algin being sufficient to make it cohere. It forms a cool, light and efficient non-conducting covering.

PHARMACEUTICAL PREPARATIONS OF THE MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Concluded from page 441.)

Tinturas, Tincturæ. Among the tinctures which are rarely employed here, the following may be mentioned, which are made in the proportion of 1:5:

Menstruum 80 per cent. alcohol; the tinctures of euphorbium and of all balsams, turpentine, gum resins and resins; also the tinctures of cloves, Winter's bark, fruit of *Myroxylon*, mace, nutmeg and *contrayerva*.

Menstruum 60 per cent. alcohol; the tinctures of arnica leaves, sabadilla, *Artemisia mexicana*, *Hydrocotyle asiatica*, calinea, *Aristolochia fragrantissima*, Arris root, *Cissus tiliacea*, mustard and other seeds.

Tinture de raíz de Jalapa compuesta, Tinctura de radice jalapæ composita.—Jalap 40, turpeth root 5, Aleppo scammony 40, alcohol (60 per cent.) 480; macerate for 10 days and filter.

Triaca, Theriaca.—Powder the following substances: Gentian 40, ginger 20, valerian 20, anise 20, cardamom 20, pepper 10, cinnamon 20, myrrh 10, saffron 10, opium 10, ferrous sulphate 10, mix these powders with moderately warm honey 720 and add Sherry wine 40. Contains approximately 1 per cent. of opium.

Uncion fuerte, Unguentum cum Cantharidibus.—Marshmallow ointment 200, nervine ointment 100, powdered cantharides 25, pepper 25, euphorbium 12; mix. As a vesicant in veterinary practice.

Ungüento amarillo (basilicon), Unguentum pallidum s. basilicum.—Yellow Campeachy wax 500, mutton suet 500, colophony 1,000, sesame oil 800.

Ungüento bruno, Unguentum fuscum.—Mercuric oxide 20, burnt alum 10, basilicon ointment 150. Used as a detergent and for phagedenic chancres.

Ungüento contra escabia, Pomatum ad scabiem ex Alderete.—White wax 120, turpentine 250, lard 1,000, carbonate of lead 380, lemon juice 250, mercuric chloride 15, burnt alum 15, yelk of egg 6.

Ungüento de Altea, Unguentum Althææ.—Yellow Campeachy wax 500, colophony 500, oleoinfusion of fennugreek 900.

Ungüento de Agripa, Unguentum ex Agripa.—Take of squill, dry, 125, and the following drugs in the fresh state: leaves of *Sambucus mexicana* 500, root of *Bryonia variegata* 250 and root of *Iris germanica* 250, add sesame oil 2,000, boil gently until all the moisture has been expelled, express, strain, add for every 500 gm. of liquid 125 gm. of white wax and melt together.

Ungüento de Artanita compuesto, Unguentum Arthanitæ compositum.—Melt together white wax 150 and lard 2,500, add the following in fine powder: scammony 30, jalap 30, colocynth 30, aloe 30, sodium chloride 15, euphorbium 15, myrrh 15, pepper 15, ginger 15 and chamomile 15; agitate the mixture continually while cooling. Radix Arthanitæ is the tuber of *Cyclamen europæum*, which is not used in the foregoing formula, nor in that published by Hager in

"Phar. Praxis I," 934; it was, however, formerly used in such an ointment, for a formula of which see "Jourdan, *Pharmacopée univ.*" (1828) I, 445.

Ungüento de Isis, Unguentum cum Acetate cuprico.—Yellow Campeachy wax 750, colophony 1,000, turpentine 250, lard 1,000, finely powdered verdigris and burnt alum, of each 80.

Ungüento de Mercurio doble, Unguentum Hydrargyri.—Melt together white wax 60 and lard 400; of this mix 100 parts with sweet gum (liquidambar) 40, and triturate with mercury 500, until completely extinguished; then incorporate with the remainder of the fatty mixture.

Ungüento de Osorio, Unguentum ex Osorio.—Suet 500, lard 1,000, strained sweet gum 120, oil of lavender 25.

Ungüento de todos Sebos, Unguentum Seborum.—Mutton suet 125, lead plaster 15, lard 500.

Ungüento del Corazon, Unguentum cordiale.—Finely powdered red saunders 30, compound rose powder 12, camphor 4, lard 500.

Ungüento de la Condesa, Unguentum Comtissæ.—Melt in a suitable vessel lard 600 gm., add 30 gm. each of finely powdered nutgalls, cypress cones, pomegranate bark and arrayan leaves and stir continually while cooling.

Ungüento encarnativo, Unguentum cum Oxydo plumbico rubro.—Red lead 60, lard 500.

Ungüento nervino, Unguentum nervinum.—Fresh rosemary and laurel leaves, each 250, lard 875, suet 386; digest until the leaves have become crisp, add yellow wax 98, express, strain and mix with oil of bricks (rapeseed or olive oil distilled from broken bricks), oil of rosemary and oil of juniper, each 15.

Ungüento santo, Unguentum cum Oxydo zincico et Subacetate cuprico.—Prepared tutty 30, verdigris 8, lard 500.

Vino cordial, Vinum cordiale.—Tincture of cinnamon 10, red wine 90.

Vino de Catecú, Vinum cum Catechu.—Tincture of catechu 80, Sherry wine 1,000.

Vino de Escila, Vinum scilliticum.—Squill 30, sugar 15, alcohol (60 per cent.) 30, Sherry wine 470; macerate for 10 days, express and filter.

The wines of rhubarb and of the root and seeds of colchicum are made in the same manner.

Vino de extracto de Quina y Fosfato férrico-citro-amoniacal del

Dr. Hidalgo Carpio, Vinum cum extracto Cinchonæ et Phosphate ferrico-citro-ammoniaco ex Hidalgo Carpio.—Citro-ammonio-ferric phosphate 8, extract of gray cinchona 2, Sherry wine 600.

Vino de Quina Calisaya, Vinum de Cortice Cinchonæ Calisayæ.—Calisaya bark 30, alcohol (60 per cent.) 60; macerate for 24 hours, add sugar 30 and Sherry wine 940, and after 10 days maceration express and filter.

In the same manner, but doubling the proportion of the drugs, are prepared the wines of red and gray cinchona, colombo, quassia, gentian, *Artemisia mexicana*, coca and jaborandi.

Vino de Yoloxochitl, Vinum de floribus Magnoliæ mexicanæ.—Tincture of magnolia flowers (see page 290) 100, Sherry wine 900.

Vino de Zarzaparrilla, Vinum cum extracto Smilacis medicæ.—Alcoholic extract of sarsaparilla 120, alcohol (60 per cent.) 60, Sherry wine 700, clarified honey 120.

Vino ferruginoso, Vinum martiatum.—Ammonio-ferric citrate 5, sugar 30, Sherry wine 1,000.

We have given in several numbers of the JOURNAL under the title of this paper all the formulas of the Mexican Pharmacopœia, which appear to us to be unique; in addition to these a large number have been admitted which are identical with those of the present or former French Codex.

GLEANINGS FROM FOREIGN JOURNALS.

BY GEORGE H. OCHSE, PH.G.

An almost tasteless tannate of quinine is obtained by dissolving 60 Gm. tannic acid in 11 Gm. of water, without heat, and adding 11 Gm. of a 2 per cent. solution of sodium bicarbonate, and enough water, if necessary, to make a clear solution. To this solution is added a solution of 40 Gm. quinine sulphate in 27 Gm. of dilute sulphuric acid and 11 Gm. of water. The precipitate is washed on a linen strainer until the washings cease to have an alkaline reaction; it is then dried and powdered. Prepared thus, tannate of quinine contains about $33\frac{1}{3}$ per cent. of quinine, and is cheaper than the commercial article, which frequently contains but 20 per cent. of quinine.—*Pharm. Centralhalle*.

Fixed Oils as Solvents for Iodine.—A 20 per cent. solution of iodine in castor oil forms a thick brown liquid; the solution in olive oil or almond oil is of a reddish brown color, and not so thick. The castor

oil solution can be diluted with alcohol, thus overcoming the disagreeable effects produced by an alcoholic tincture. A formula for tinctura iodi cum oleo ricini is as follows: \mathcal{R} Iodine 10, castor oil 45; dissolve with a moderate heat and add alcohol 45.—*Arch. d. Pharm.*

Emulsion of Cod Liver Oil.—The following is said to be a good formula: Olei morrhuae, 62; acaciæ pulv., tragacanthæ pulv., marantæ, aa 1; syrupi, 10; aq. destill., 55. Mix the powders in a mortar and add the oil; pour into a bottle, add 31 of water, and shake for 10 minutes. When the oil is emulsified the syrup and balance of the water are added.—*Schweiz. Wochenschrift.*

Quillaia bark is recommended as being preferable to senega by Dr. Kobert who states, as the result of his experiments, that quillaia contains two glucosides which are identical with the glucosides of senega, quillaia containing about five times as much as senega. He administers it in decoction (5:200), and owing to its sweet taste it is very readily taken by children, seldom producing vomiting or diarrhœa.

Detection of Cyanides in the Presence of other Salts.—Mr. W. J. Taylor distils with sodium bicarbonate instead of tartaric acid. In thus distilling a 10 per cent. solution of ferrocyanide of potassium no trace of hydrocyanic acid was found, while in the distillate from a $\frac{1}{100}$ per cent. solution of potassium cyanide, treated with ammonium sulphide to form sulphocyanate of ammonium, hydrocyanic acid could readily be detected. To cyanide of mercury a piece of metallic zinc must be added. The presence of sulphate of potassium, ferrocyanide or ferridcyanide of potassium, and of ammonium salts, does not affect the reaction.

Sulphuretted hydrogen free from arsenic is readily obtained, according to Dr. Gerhard, by heating a solution of sulphide of magnesium (made by passing H_2S into milk of magnesia) to about $60^\circ C.$; when the temperature has reached about $95^\circ C.$ the reaction will be over. As milk of magnesia absorbs hydrosulphuric acid slowly, it can be made more quickly by decomposing the alkaline hydrosulphates with chloride or sulphate of magnesium.—*Arch. d. Pharm.*

Characteristic Reaction of Digitalin.—According to Lafou, a trace of digitalin can readily be detected by mixing the suspected substance with a mixture of equal parts of alcohol and sulphuric acid, heating until a yellow coloration is produced, and then adding a drop of solution of chloride of iron; if digitalin is present, a blue-green color is produced, lasting for several hours. This reaction is very delicate;

the coloration produced by 1 milligram of digitalin is very distinct.—*Schweiz. Wochenschr.*

Rust and ink stains can be removed by moistening the spots, and rubbing on them a mixture of 2 parts cream of tartar and 1 part of oxalic acid. When the stain disappears it is washed out with water. This mixture does not affect the fabric, and hence is preferable to oxalic acid alone.—*Rundschau.*

Paraldehyde suppositories can be made by fusing paraldehyde with 20 per cent. of paraffin, and dispensing in hollow suppositories.—*Fortschritt.*

Liquor Thioticus s. Sulphuratus.—Under this name Dr. Hager uses a solution of 0.2 washed sulphur in 5 cc. of carbon bisulphide, to which 5 cc. benzol and 10 cc. of ether are added, as a substitute for sulphide of ammonium or sulphydric acid. The benzol and ether are added to make the liquid lighter than water. He proceeds as follows: A small quantity of solution of caustic soda is added to some of the test liquid; the substance to be examined is then added and the mixture heated to boiling, agitating constantly. To test for arsenic, antimony and tin, muriatic acid is added after the evaporation of the ether. *Liquor thioticus* is readily prepared and free from the disagreeable odor of sulphuretted hydrogen.—*Rundschau.*

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from page 507.)

Chile. The different species of *Capsicum*, growing wild or cultivated in Mexico, and used medicinally or for condiment, are the following: *pasilla*, *C. longum*, *De Cand.*; *ancho*, *C. cordiforme*, *Mill.*; *mulato*, and in the unripe state *poblano*, probably a variety of the preceding; *valenciano*, *C. dulce*, *Hort.*; *tzincuayo*, *C. violaceum*, *H. B. K.*; *quanchilli*, *C. frutescens*?; *chiltipiquin de Papantla*, *C. annum*, *Lin.*, and *chilticpin de Jalisco*, *C. microcarpum*, *De Cand.*

Chilillo, *Polygonum Hydropiper*, *Lin.*, is used in baths against rheumatism, and internally in the form of infusion, as a diuretic. *Pol. aviculare*, *hydropiperoides* and other species are said to be frequently substituted for the former.

Chirimoyo, *Anona Cherimolia*, *Miller*; *Anonaceæ*; in warm and damp regions. The fruit is nutritious. The seeds, slightly roasted, are violently emeto-cathartic in doses of one to twelve, and are too dangerous for medicinal use; externally they are insecticide. Garza Cortina of Mexico (1872) found the seeds to contain sugar, gum, albumin, extractive, salts, fixed oil and an acrid resin soluble in alcohol, ether and chloroform and representing the active principle.

Chochos, *Lupinus albus*, *Lin.*; *Leguminosæ*; cultivated. The seeds were formerly used as an aphrodisiac and vermifuge; the decoction is employed in the form of injection in external otitis; also as a discutient.

Damar (dammar), Datil (dates), Dícamo blanco (*Dictamnus albus*), Dícamo de Creta (*Origanum Dictamnus*), Digital, Duboisia, Dulcamara, Eléboro blanco (*Veratrum album*), Eléboro negro (*Helleborus niger*), Eléboro verde (*Hell. viridis*), Encina de mar (*Fucus vesiculosus*), Enebro comun (Juniper berries), Eneldo (dill), Enula (elecampane), Escamonéa (scammony), Escila (squill), Escordio (*Teucrium Scordium*), Espárrago (asparagus roots and shoots), Esperma (spermacei), Esponja (sponge), Estafisagra (stavesacre), and Eucalipto (*Eucalyptus globulus*), are foreign drugs admitted into the Mexican Pharmacopœia. The eucalyptus, asparagus, dill and a few others are cultivated in Mexico.

Damiana, *Aplopappus discoideus*, *H. B. K.*; *Compositæ*; in the valley of Mexico, etc. Used in baths against rheumatism. The plant does not possess any aphrodisiac properties which have been claimed for it.

Dícamo real, *Passiflora Dictamnus*, *Fl. Mex. ined.* and *P. mexicana*, *Jussieu*; *Passifloraceæ*; in the State of Morelos and other hot districts. The former species has simple two-lobed leaves, the lobes oblong and three-nerved, the base subemarginate, the peduncles one-flowered and the tendrils simple. The second species has the base of the leaves rounded, their lower side glandular and the petioles shorter. The leaves and stems are used in decoction in bronchial and pulmonary affections. The leaves of the "granadita de China," *Pass. cærulea*, *Lin.* probably have similar properties; the fruit is used for food, and the root is said to be emetic. *Marrubium Pseudodictamnus Lin.* is also known in Mexico by the name of dícamo.

Diente de leon, *Taraxacum mexicanum*, *De Candl.*; *Compositæ*; in Mexico. The root and leaves contain a milk juice, without particular odor, bitter, somewhat sweet and slightly acid. The root is blackish

externally and white internally. The leaves are radical, rosulate, and irregularly and triangularly lobulate. The constituents are probably analogous to those of *Taraxacum Dens-leonis*. The root is employed as a substitute for chicory.

Doradilla, *Lycopodium nidiforme*, *Flor. Mex. ined.*, Lycopodiaceæ; in the valley of Mexico. The decoction is employed in biliar lithiasis, and as a sedative in hepatic colics.

Durazno, *Persica vulgaris* *De Cand.*; Rosaceæ; cultivated in Mexico. A syrup is prepared from the flowers, which, like the leaves contain hydrocyanic acid, the latter being sometimes used as a substitute for cherry laurel leaves. The seeds are incorrectly called bitter almonds. The fermented pulp of the fruit produces an agreeable alcohol.

Ecapatli, *Cassia occidentalis*, *Lin.*; Leguminosæ; in the State of Mexico. The leaves are believed to have the properties of senna leaves.

Encina, *Quereus polymorpha*, *Schlechtendal*, *Q. barbinervis*, *Bentham*, *Q. tomentosa*, *Willdenow*, and other species are used, the bark being astringent; the fruit, called bellota (see p. 385) is roasted like coffee.

Epazote, *Chenopodium ambrosioides*, *Lin.*; indigenous. The entire plant is used as a condiment, and medicinally as an anthelmintic, emmenagogue and in chorea; an infusion is made of 20 Gm. to the liter.

Escila del pais, *Paneratium illyricum*, *Lin.*; Amaryllidaceæ; cultivated in Xochimilco, etc. The bulbs are 45 to 60 Mm. thick, napi-form, scaly, externally reddish-brown, internally whitish; have a slightly nauseous odor, and a sweet, afterward bitter taste, and possess diuretic and hyposthenic properties. Dose 0.10 to 0.20 Gm.

Escoba amarga, probably *Milleria linearifolia*, Compositæ. The plant is common in the valley of Mexico and flowers in September. Stem herbaceous, almost filiform; leaves alternate, sessile, linear; involucre of 3 to 5 bracts; receptacle not chaffy; ligulate florets pistillate; tubular florets staminate; akenes smooth and compressed. Bitter, tonic; dose 4 to 8 Gm. in infusion. The different species of *Milleria* have opposite leaves.

Escorzonera de México, *Pinaropappus roseus*, *Lessing*; Compositæ; in the valley of Mexico. An infusion of the plant is used in diarrhœas.

Espinosilla, *Hoitzia* (*Læselia*, *Don*) *coccinea*, *Cavanilles*; Polem-

oniaceæ; in the valley of Mexico, etc. Dr. Oliva found the plant to contain greenish-brown resin, tannin, gallic acid, bitter extractive and salts. The infusion is diuretic and diaphoretic, and in larger doses, emetocathartic.

Esponjilla, probably *Luffa purgans*, *Kunth*; Cucurbitaceæ; in the State of Guerrero. The aqueous infusion of the fruit has a very bitter taste and drastic properties.

Estafiate, *Artemisia mexicana*, *De Cand.*; Compositæ; near the capital and in the valley of Toluca. Leaves on the upper side dark green, on the lower side ash colored, strongly aromatic, bitter, and of a warm taste, amplexicaul, quinque-pinnatisect, pubescent, the lobules trisected and the final divisions linear. In Oliva's *Farmacologia* the plant is named *Art. laciniata*, which is cultivated in Guadalajara. Rio de la Loza obtained from the plant a blackish-gray extractive, bitter nitrogenated and bitter resinous principle, yellow volatile oil, starch, salts, etc. Alcohol and water take up the medicinal principles. The plant is tonic, stimulant, emmenagogue and anthelmintic. Dose 2 to 4 Gm. in powder; 4 to 15 Gm. in infusion; 1 to 4 Gm. of the extract; 1 to 6 drops of the volatile oil; the latter is generally used externally, mixed with a fixed oil.

Flor de encino de Puebla is the name given to the staminate catkins of the different species of *quercus*, which are reputed to possess anti-spasmodic properties.

Flor de noche-buena, *Euphorbia pulcherrima*, *Willdenow*; Euphorbiaceæ; on the western slope of the Sierra Madre, and cultivated in gardens. The bracts are used; they are short-petioled, lanceolate, attenuate below, penninerved, entire on the margin, fresh of a blood-red color, and dark violet-red after drying. T. Artigas (Thesis, 1880) obtained resin, yellow and red coloring matters, tartaric acid, glucose, saccharose, gum, starch and salts. The decoction, made of 8 Gm. of the bracts and 500 Gm. of water, and taken in two portions during the day, is reputed to be galactophorous; is used as a fomentation in erysipelas, and in the form of cataplasm as a resolvent. The milk-juice is used as a depilatory.

Flor de San Juan, *Bouvardia longiflora*, *Kunth*; Rubiaceæ; in the southern mountains of the Mexican valley. The flowers are used in perfumery.

Flor de Santiago, *Amaryllis formosissima*, *Lin.*; Amaryllidaceæ; in the State of Puebla. The bulb is emetic.

Fresno, *Fraxinus viridis*, *Michaux*; Oleaceæ; Central Mexico. The root is popularly used as a diuretic, and the bark as a tonic and febrifuge; the juice of the leaves is similarly employed. The tree is indigenous to the greater portion of the North American continent from Canada westward to Dakota and Arizona.

The following well-known drugs have been admitted: Fresa (strawberry root and fruit), *Fumaria officinalis*, Galanga, Gálbano, Gelsemio (*Gels. sempervirens*), Goma arábica, Goma elástica (India rubber), Goma guta (gamboge), Goma de Mezquite, Goma quino (kino), Goma del Senegal, Goma tragacanto, Gomo-resina amoniaco, Gomo-resina de euforbio, Grama (*Triticum repens*), Granado (root-bark, flowers, pericarp and fruit-juice of pomegrante), Grasilla (sandarac), Guayacan (guaiaicum), Haba (bean), Haba de Calabar, Haba tonca, Helecho macho (male fern), Hiel de toro (ox gall), Higos (fig), Higuierilla (seeds of *Ricinus communis* for extracting the oil), Hinojo (fennel), Huevo de gallina (egg) and Huitlacoche (cornsmut).

MILK AS A VEHICLE FOR IODIDE OF POTASSIUM.—Dr. E. L. Keyes, speaks highly of milk as a vehicle for the administration of iodide of potassium. He says that in cases where a large quantity of the drug has been given, he has found that the stomach does not rebel when milk is used as the vehicle. Ten grains or more of the iodide in a gill of milk make a palatable drink, and impart only a mild metallic taste to the fluid, which most patients find not at all disagreeable.—*N. Y. Med. Jour.*; *Cinci. Lancet*, May 23, 1885.

INTRA-UTERINE INJECTIONS OF CORROSIVE SUBLIMATE.—Winter ("Ctrlbl. f. Gyn.;" "Cntrlbl. f. d. ges. Therap.") regards solutions of corrosive sublimate as generally employed, as being too strong, and affirms that in the proportion of one to five thousand all the antiseptic action of the drug can be obtained, without incurring the risk of occasioning toxic symptoms.—*N. Y. Med. Jour.*, May 9, 1885.

OZONEIN is stated to be condensed ozone preserved in a permanent form, and to possess powerful disinfectant properties. Brand found it, when evaporated in hospital wards to be a valuable means of purifying the atmosphere. It was used with excellent results during the cholera epidemic at Toulon.—*Jour. de Méd., Paris*.

VERATRINE IN MUSCULAR TREMOR.—Féris (*Jour. de méd. de Paris*,") recommends this drug in muscular tremor, especially when due to alcoholism or disseminated sclerosis. He gives four pills daily, each containing one one-hundred and twenty-eighth of a grain. A cure, he says, may be confidently expected in from a week to two weeks.—*N. Y. Med. Jour.*, May 23, 1885.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

The sugar of senna leaves was isolated by Kubly in 1865, and named cathartomannit. Alfred Seidel has further examined this substance for which he proposes the name *sennit* and published his results in an inaugural essay, Dorpat, 1884. The most satisfactory process for preparing this sugar was by concentrating in vacuo the aqueous infusion of the leaves, precipitating mucilage and salts from the syrupy liquid by two volumes of strong alcohol, filtering, distilling off the alcohol, diluting the residue with water, digesting for 24 hours with oxide of lead, again evaporating in vacuo to a syrupy consistence, crystallizing upon flat plates over burned lime, which requires 4 or 5 weeks, and purifying by recrystallization from methyl alcohol and washing with absolute alcohol. Thus prepared sennit has the composition $C_6H_{12}O_5$ and forms colorless microscopic hemiedric crystals of the rhombic system, mostly sphenoids with curved sides. It has a very sweet taste, melts at $183^{\circ}C.$ (corrected 185.6°), and is soluble at ordinary temperature (about $20^{\circ}C.$) in $1\frac{3}{4}$ parts water, 450 absolute alcohol, 48 alcohol of 90 per cent., 82 methyl alcohol, and about 10,500 parts of absolute ether. It is dextrogyrate, unfermentable, prevents the precipitation of copper and iron salts by alkalis, and does not reduce Fehling's solution (also not after boiling with acid), silver nitrate, or solutions of gold or platinum. By treatment with diluted nitric acid, it yields oxalic acid, but no mucic acid. On evaporating sennit with an excess of diluted nitric acid, a snow-white mass is left which dissolves with an intense yellow or yellow-red color in ammonia, and with a yellow color in sodium acetate; on the addition to the ammoniacal solution of a drop of barium chloride solution, a reddish brown precipitate is produced, the liquid gradually becomes rose-colored and on spontaneous evaporation leaves a raspberry-red residue. Similar colorations are produced by strontium chloride, but the residue is in transmitted light rose-colored, while in reflected light it is green and has a metallic lustre. These characteristic color reactions are at once produced in the solution in sodium acetate mentioned above. Inosit, quercit and probably pinit, give a similar reaction, but not mannit, dulcit, glucose or saccharose. Compounds with calcium, barium and lead were prepared, also an acetyl compound, showing sennit to be a pentatomic alcohol.

Oranges as a galactagogue. A case is reported in the "N. C. Med. Jour." in which the eating of oranges proved beneficial in deficient milk secretion, causing a plentiful flow of milk.

Capparis coriacea, Burch, is a South African shrub, without spines and with oblong obtuse and glabrous leaves. The fruit of a Chilian plant to which the same name is applied by Dr. Larrea y Quesada (*Boletín Medico*) is recommended in nervous complaints, hysteria, epilepsy, etc., the powder being given in wine in doses of about 45 Gm. taken twice a day.

Similar properties have long been attributed to *Capparis cynophallophora*, Lin., which is a shrub or small tree with very variable coriaceous leaves either orbicular, oblong or linear, and a linear silique-shaped fruit. This plant grows in the West India Islands and from Panama southward to Guayaquil and Bahia. The root of another West Indian shrub, *Capparis siliquosa*, Lin., now regarded as a variety of *C. jamaicensis*, Jacquin, has likewise been used as an anti-hysterical, but also as an aperitive and anthelmintic; its leaves are silvery tomentose or pale rusty beneath, glossy above, elliptic or lance-oblong in shape and pointed while the variety *emarginata* has obtuse or emarginate leaves. These and some other West Indian species are stated by Baillon to be acrid and even vesicant.

C. spinosa Lin., which yields the well known capers and is indigenous to the Mediterranean basin, is stimulant, antiscorbutic, diuretic and aperient, and similar properties are ascribed to several Egyptian and East Indian species.

Andira inermis, Kunth. The bark of this West Indian tree is again recommended as an anthelmintic by Midy (*Nouv. Remèdes*.) For use an ounce of the bark is boiled in a quart of water until the decoction has become of a wine color, the average dose for an adult being two ounces. It should be administered in small doses gradually increased, the occurrence of nausea being regarded as proof that the maximum dose has been attained; in overdoses it is said to be narcotic. The active principle is said to be a glucoside *andirin*.

This bark has been known and occasionally medicinally employed since the middle of the eighteenth century. Hüttenschmidt (1824) isolated from it an alkaloid which was named *jamaicine*, but was by Gastell (1866) shown to be identical with berberine. The name *andirin* was given by Peckolt (*Archiv d. Phar.*, 1858, vol. 146, p. 38) to a brown-yellow coloring matter, which may perhaps be identical

with berberine, and which was obtained from the wood of *Andira anthelmintica*, *Bentham*. In addition to this the wood contains a soft pungent and bitter resin, soluble in ether and alcohol, but insoluble in chloroform; this it seems has drastic and anthelmintic properties, and is also contained in the seeds, which are used in Brazil for their vermifuge properties under the name of *angelim amargosa*.

Evodia longifolia, nat. ord. Rutaceæ, is a native of the Fiji Islands. The leaves are said to be useful as a preventive of abortion; they are steeped in the milk of the cocoanut, the infusion being taken for several weeks or months.

A Brazilian species *Evodia* (*Esenbeckia*, *Martius*) *febrifuga*, *Saint Hilaire* is astringent and tonic, the bark having been occasionally used in the place of angustura bark (see *Am. Jour. Phar.*, 1874, 50, 414); it is known in Brazil in different provinces as quina, tres folhas vermelhas, or larangeira do matto.

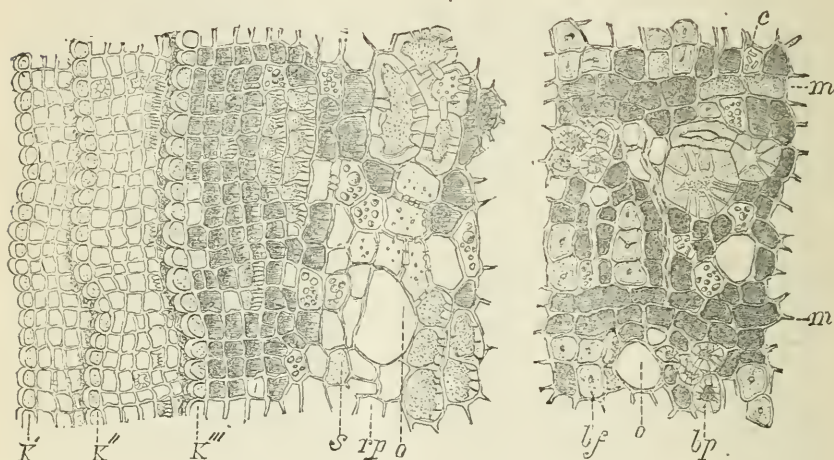
The bark of the Japanese *Evodia glauca* contains berberine (see *Am. Jour. Phar.* 1879, 26.)

Grindelia robusta, *Nuttall*, is recommended by Dr. Gatchell (*N. Y. Med. Times*) as a topical application in the treatment of stings and bites of insects. A lotion prepared with it is stated to stop the itching and promote the healing of the mosquito or flea bites.

A false clove bark or clove cinnamon has been received by Dr. John Moeller, from Hamburg. It is in flat pieces of about the width of a hand, 7 mm. or less thick, cinnamon brown and covered with a thick, warty, ash-gray or yellowish green cork; the odor has a resemblance to sassafras, and the taste is sharp, entirely unlike cloves and cinnamon. The periderm is sharply defined; a sclerenchyme ring is not observable; the middle bark is indistinctly dotted, and the inner bark darker and striate from delicate wavy medullary rays.

Under the microscope the cork is seen to consist of a number of layers, sometimes twelve or more, the cork evidently having been developed centripetally from the epidermis, and the layers corresponding to different periods of vegetation, terminating with a row of cells resembling epidermal cells, with the outer wall rounded and thickened, while the remaining cork cells are nearly square, rather thick walled, and occasionally with a cushion-like thickening of the inner wall. Secondary cork has not been observed. The parenchyme of the middle bark (phelloderm) contains numerous scattered cells with sandy crystals of calcium oxalate, and somewhat larger oil cells with colorless

volatile oil, and many cells have their walls, particularly the inner one, materially thickened. The inner bark contains rather indistinct medullary rays, of one to four rows of cells; the bast parenchyme is often sclerose, the cells being staff-like or much enlarged and deformed; sieve tubes are present in rather distant groups; the crystal cells frequently contain several well-formed prisms; the bast fibres are single or in interrupted tangential rows, are spindle-shaped, about 0.5 mm. long, 35 micromm. broad, colorless, and upon cross section roundish rectangular and with a very fine cavity.



False clove bark—transverse section. *K'*, *K''*, *K'''*, layers of cork; *rp* bark parenchyme; *s* crystal cell containing sandy oxalate; *o* oil cells; *m* medullary rays; *bf* bast fibres; *bp* sclerotic bast parenchyme; *c* crystal cell.

The parenchyme cells contain a homogeneous or granular red-brown mass, insoluble in alcohol, partly soluble in water and alkalies, and colored green by iron salts. The bark is doubtless derived from a laurel, probably a species of *cinnamomum*; but it does not resemble any officinal bark, and in substance as well as powdered, it is easily distinguished from cinnamon by the large number of stone cells and the presence of staff cells, from clove bark by the presence of bast fibres, and from both by the deep brown-red contents of all parenchymatous cells. ("Phar. Centrallh." 1885, 251-253.)

Guachamacá. Dr. Kobert, of Strassburg ("Phar. Zeitung," 1885, No. 51), gives the history of this plant, of which the following is a brief abstract:

Guachamacá was first mentioned in 1841 by A. Codazzi, in a geographical work, and erroneously referred to *Ryania coccinea*. In his "Scenes of South American Life" (1862), Ramon Paéz, who had not seen the plant, gave an account of its poisonous properties. R. de Grosourdy (1864), in his "Medico criollo botánico, described the plant under the name of *Guachamaca toxifera*, and having seen only bad specimens of flowers and no fruit, correctly referred it to the Apocynaceæ. In 1869 Ernst, of Caracas, procured a leafy branch and two small roots, which were experimented with by A. Frydensberg with the result that the branch was found to contain a potent poison, and the root to be not poisonous. Joseph Hooker then supposed the plant to be a species of *Prestonia*. The wood, leaves, flowers and fruit, which were exhibited at the Exposición de Centenario por la Sociedad Patriótica de San Fernando de Apure (1883), furnished the material from which Ernst (1884) determined the plant to be a *Malouetia*, and Hooker recognized it as *Malouetia nitida*, Spruce. Frydensberg (1882) ascertained that the aqueous extract of the bark used on animals, produces paralysis without apparently disturbing the sensibility. Carl Sachs, who had collected (1876) a quantity of the plant in Venezuela, subsequently determined that the action of the poison resembles that of curare, and after his death an alkaloid, *guachamacine*, was isolated by J. Schiffer (1883) which possesses the action of curare and closely resembles curarine, though probably not identical with it.

Kobert now directs attention to the difference in origin of the various kinds of curare as had been ascertained by Planchon, and that the best curare comes from the Orinoco and Rio Negro where the guachamacá plant appears to be not scarce; also that the properties of the guachamacine indicate its identity with curarine, and he urges that the former be carefully studied, both chemically and physiologically.

The history as given above is contained in a pamphlet by A. Ernst, entitled *El Guachamacá* and published in Caracas 1885; from this we condense the following botanical description:

A shrub 4 or 5 meters high; bark rather thin, either ash-gray (*guachamacá blanco*) or dark colored (*g. negro*), longitudinally striate; wood yellowish white, branches opposite, the bark with numerous small white lenticels. Leaves, simple, entire, short-petiolate, elliptic-lanceolate, narrowed below, sharp pointed, apple-green and glossy above, paler beneath, 10 or 12 cm. long, 3 or 4 cm. broad, the nerves forming near the margin a curved line, the bases of the opposite petioles almost

united by broad membranous false stipules, which are caducous and leave a transverse scar. Flowers in axillary groups; calyx five-parted, membranous on the margin, the divisions triangular and scarcely acute; corolla salver-shaped, yellowish, exceeding the calyx, the tube about 1 cm. long, the limb five-parted, and on the inner side white hairy; stamens 5, inserted in the throat, the anthers connivent. Ovary round, with a slight furrow, hairy above and surrounded by a nectary of 5 rather large glands. Style filiform, the glandular stigma projecting from the anthers. Follicle round, dehiscient by the ventral suture, 15 or 16 cm. long, 5 or six mm. thick, striate, dark gray. Seeds 7 or 8, nearly cylindrical, obliquely truncate, with a longitudinal furrow, about 2 cm. long, gray, not hairy, the endosperm thin and adhering to the testa; radicle superior, about 2 mm. long; cotyledons elliptic, 10 to 12 mm. long, adhering above.

Pangium edule, Reinwardt; nat. ord. Bixaceæ. Attention has been recently directed by Chatel ("Jour. de Méd. de Paris") to the medicinal properties of this tree which are well known in the East Indian islands, where the tree is indigenous and cultivated. It attains a considerable size, and has alternate, stipulate, long-petiolate, smooth and dark green leaves, which are about 10 inches long, cordate, entire or trilobed and five- to seven-nerved. The large flowers are axillary, the pistillate ones solitary and the staminate ones cymose. The fruit is a large globular or ovate indehiscent berry with a red-brown or gray-brown punctate pericarp resembling that of the pomegranate. Imbedded in the pulp are numerous seeds attached to parietal placentas, and of an irregular globose and angular shape, one side being marked by the elongated hilum; the testa is hard and woody, dark gray or blackish, rough from projecting branching veins forming an irregular network, and encloses a fleshy and oily albumen surrounding a large embryo with a conical oblique radicle and with two foliaceous, palmately veined cordate cotyledons.

According to Blume, quoted by Baillon, the plant contains a viscous extractive matter and an alkaloid resembling menispermene. All parts of the plant are said to possess anthelmintic properties, and a narcotic action, producing headache, drowsiness, nausea and a kind of intoxication and delirium, which may terminate in death. This applies to the bark, leaves, fruit and seed, the bark as well as the leaves being also used for stupefying fish. The leaves have an unpleasant acrid taste and are often employed topically against cutaneous affections and ulcer-

ations. The seeds are used for destroying body lice; after boiling and subsequent maceration in cold water, or after being roasted they are harmless and are used as a condiment. A fixed oil is obtained from them which has a nutty flavor and is used like olive oil in preparing aliments, but has a purgative action upon those not accustomed to its use.

Pangium is botanically related to *Gynocardia* (chaulmugra) and *Hydnocarpus*.

THE BALATA INDUSTRY IN BRITISH GUIANA.

A very interesting and detailed report on this subject has been furnished to the Government by Mr. G. S. Jenman, Government Botanist, and Superintendent of the Botanic Gardens, Demerara. The report is especially valuable, as it deals with a substance which has attracted a considerable amount of attention at different times for several years past, but has never found its way into commerce in any considerable quantity, though balata has always been highly spoken of, as Mr. Jenman reminds us, as intermediate in character between india rubber and gutta-percha, combining the properties of both, and for certain purposes is better adapted than any other of the natural caoutchouc substances. "Its strength also is very great, and, as it does not stretch under tension, for special appliances, such as bands for machinery, it is unequalled. It has recently been pronounced by an American firm of manufacturers as the 'best gum in the world,' and that it has not had a greater success is due more to the hitherto limited supply than to any defect of quality intrinsically in itself." This opinion is fully borne out in a report by Dr. Hugo Muller, F.R.S.

Balata, as many of our readers will already know, is the concrete milky juice of *Mimusops globosa*, Gaertner. A large, hard-wooded forest tree, sometimes reaching a height of 120 feet, and ranging from Jamaica and Trinidad to Venezuela and French Guiana. The introductory part of Mr. Jenman's report is devoted to a sketch of the balata tree in Berbice, with notes on the characteristic vegetation. Speaking of the savannah region, he writes as follows: "The flora I found naturally very largely identical with that of the Corentyne savannah, which, though remote, are part of the same region. It presents great variety, is generally rich in color, and very interesting. Flowers are not plentiful enough, though abundant, and in many

instances beautiful in an exceptional kind of way, to give color to the ground; they are partly concealed, too, by the rather long grass, yet it would be difficult to gather anywhere a more charming bunch of wild flowers than this savannah afforded at the time of my visit. Much of the novel effect is due, I have no doubt, to the exquisite shades of color above alluded to, combined with unusual and unique or quaint forms." A list of the plants seen follows this description. Some of the discomforts of the savannah are stated to be small flies, one of which swarms about the face and creeps into the eyes, and the other "stings and leaves a durable extravasated red speck." After a few notes on the population and their mode of living, a very careful description is given of the balata tree and its distribution. From the east bank of the Berbice river to the Corentyne is the region of its greatest plentifulness in the colony, but its distribution extends still eastward beyond the Corentyne into Dutch Guiana, where a grant of several hundred thousand acres has recently been acquired by an American firm for collecting balata. The trees are more plentiful in this region, in the depths of the forest, than near the rivers, hence the creeks form arteries to the balata grounds. Several of the creeks on both banks of the Cauje are instances of this. The woodcutters of this district regard the balata tree as inexhaustible; in the interior of the forest it exists in profusion, and abundance lies beyond the reach of the balata collectors as they at present conduct their operations. As the trees near at hand become exhausted they will no doubt alter their habits and make clearings as drying places in the heart of the forest, but now they are under the obligation of returning to the settlements on the creeks with the milk they have collected to dry. Under this necessity they can at most only penetrate about two days' journey, but so far as they have explored they report there is no diminution in the abundance of trees. The forest at this depth, of course, has never been touched by woodcutters, as for convenience in getting their timber out they have to confine their operations to the banks of the river and creeks, rarely going in more than a mile or two.

The balata collector's life is described as a very hard one, as the ground is not only swampy, but often up to the armpits in water; moreover, they are often badly clad and short of food, they consequently suffer much from rheumatic affections.

The trees are tapped either standing or after felling. In the former position gashes are made through the bark in a slanting manner, meet-

ing each other half way across, so that the milk trickles from one channel into the other till it is received into a calabash placed beneath the lowest gash to receive it. Tapping the trees is often done in a very careless manner, and the trees much injured in the process.

The yield of the tree varies considerably, according to circumstances. Sometimes three pints of milk only are obtained in the course of a day, while at other times, and by a practiced hand, as much as five gallons can be procured.

To dry the milk it is poured into shallow wooden trays and exposed to as much air as possible, as well as to the sun's influence. It is, however, a slow and tedious operation. Mr. Jenman remarks that some quicker system of evaporation than that at present practiced is very desirable.

With trees of so valuable a character as that yielding balata it is most important that very great care should be taken of them, and means adopted rather to increase than diminish their numbers. The ruthless felling of trees is, therefore, to be condemned, as well as the careless tapping from which the tree receives mortal injury. Mr. Jenman justly says: "The forests should be so worked that the fullest measure of present benefit could be taken from them without impairing in any degree their future value." The report concludes with some considerations or suggestions on the better conservation of the forests, some of the remarks on which might be almost equally applied to trees other than those furnishing balata.—*Phar. Jour. and Trans.*, Sept. 5, 1885, p. 212, from *Gardeners' Chronicle*, Aug. 15.

NOTES ON COTTON SEED OIL.¹

BY W. GILMOUR.

It is not my intention to take up the time of the Conference with any apology for bringing this subject forward at the present time. An oil that has been made officinal in one of our great national pharmacopœias, and which is also being imported into, as well as manufactured in this country in very large quantity, is not without interest to every pharmacist, and I think requires no apology for its introduction.

The great source from which the cotton seed oil imported into this country is derived is, of course, America, the oil being expressed from

¹ Read before the British Pharmaceutical Conference.

the seeds of various species of *Gossypium*, and subsequently purified. The oil extracted and purified in this country is not derived to any extent (if at all) from seeds obtained from America, but from seeds obtained from other channels, and which are known in this country simply as Egyptian or African, according to the port, I presume, from which they are imported. I have here present samples of the three different kinds of seeds, or rather, I should say, of seeds obtained from the three different sources, namely, American, Egyptian and African, but I have little expectation that the species of *Gossypium* from which they are derived will be determined from them, as they exhibit no very special or distinctive characteristic. The fact, however, that the oil is not only from seeds derived from a variety of species, but also from sources geographically so different, will probably be sufficient to account for any little variation afterwards noticed in the physical or chemical properties of the samples which I have examined. The seeds yield from 12 to 20 per cent. of oil, and as first extracted it is a very dark and dirty-looking mixture, as shown in the sample on the table. This crude oil has a specific gravity from .928 to .930. After purifying, it takes from a bright pale yellow to a deeper golden color, and according to the United States Pharmacopœia should be "odorless with a neutral reaction, specific gravity .920 to .930, congealing at a temperature near to 35.6°F.," etc. I have on the table a sample of pure American oil, and also one home extracted and purified from Egyptian seed. It will be seen that while the two oils closely resemble each other in smell and taste, they differ somewhat in color, the home prepared being of a deeper yellow. Every sample which I have examined, whether home or foreign, exhibits very much the same characteristics as regards smell and taste, the smell being not altogether odorless, but like olive oil when fresh and sweet, devoid of anything distinctive or offensive, while the taste is peculiarly bland and with a nut-like sweetness.

The first point I would particularly notice is the density of the oil. The United States Pharmacopœia, as well as several text-books, all give the specific gravity of cotton seed oil as .920 to .930. This is correct enough if intended to embrace both purified and crude oils, but .930 is much too high applied to the refined oil alone, and is misleading if density is to be relied upon as a test of adulteration with the lighter and more valuable oils, such as olive or almond. Out of many samples examined I have never found the specific gravity to go

below .920 and never above .923. The greater number of samples average from .920 to .921.

The next point I would notice is the "congealing" point. This, of course, is very much a matter of arrangement on the part of the refiner, but I am speaking at present of this oil as it is to be found commercially. Even with the uniformity of specific gravity just mentioned, I have found considerable variation in the freezing point, some samples beginning to thicken at a temperature of 45°F., or even above this, while others did not thicken until some degrees below 32°. The former samples, I may state, were mostly home prepared, the latter, American. I merely mention this point to show that a considerable variation may exist in the physical properties of many genuine oils at present in circulation.

Another point which I endeavored to determine was the keeping properties of this oil. I have noticed, elsewhere, the case of a sample which I had in my possession for nearly ten years, and which, although devoid of the nutty sweetness of a fresh sample, had not developed rancidity or smell to any extent. I have here two samples, one of American origin, and one home prepared, which I have had exposed to bright sunshine for nearly four months. The members will be able to judge for themselves of their keeping properties under this crucial test. They have both bleached somewhat lighter in color, but they have not developed any smell, while the taste is still sweet and nutty, and no test that I have been able to apply has detected the least acidity. Under similar conditions olive oil develops both taste and smell, and acidity also may readily be detected.

Another point which I was anxious to determine, and which is important from a pharmaceutical point of view, was the place which cotton seed oil held among the fixed oils as regards drying properties. Opinion seems to be pretty much divided upon this point, but my experiments show that those authorities who place this oil midway between a drying and a non-drying oil are about correct. Taking for example five weighed quantities of cotton I saturated them with a weighed quantity of home prepared cotton seed oil, of American oil, and of olive, almond and linseed oils, respectively, and placed them on the water-bath. Six hours' exposure to this heat having made no perceptible change on any of the samples, with the exception of the linseed, I transferred them to the sand-bath and carefully cooked them over it until the linseed sample was hard and dry. At this stage the

two samples of cotton seed were getting a little viscid and slightly sticky, showing that they were in process of drying. The olive and almond samples remained soft and free. Next applying the nitrate of mercury test, as recommended by Pontet (12 grams of mercury dissolved in 11 cc. cold nitric acid of specific gravity 1.42, and 8 grams of this solution shaken frequently with 90 grams of oil), and for purposes of comparison taking also equal quantities of olive and almond oils, I found that olive oil solidified in two and a half hours, almond oil in a little over four hours, while the one sample of cotton seed oil took eight hours, and the other nearly sixteen hours to thoroughly solidify. These experiments, I think, prove that it lies as it were intermediate between a strictly drying and a non-drying oil.

The last point which I was anxious to determine was the saponifying power of this oil. I noticed at a very early period of my experiments that it formed the *Pharmacopœia* liniments of lime and ammonia with some difficulty, and even where the oil was got to incorporate with the alkalies the liniment was never to any extent permanent. From their behavior in this respect I concluded that some observations on the saponifying power of cotton seed oil might be valuable. I am sorry, however, I have not had time to undertake this, and principally from the fact that an investigation of this kind promised to be interminable.

I have found no two samples exactly to agree, and, therefore, any observations on individual samples are practically useless. I have here, for example, two samples of oils which, as regards their behavior with alkalies, may be regarded as typical, the one forming an emulsion with the alkalies, but separating more or less after a time, the other utterly refusing to form an emulsion of any kind. The latter oil I know to be genuine, but whether this peculiar behavior is owing to any physical or chemical difference in the oil from causes already mentioned, or whether it is owing to some peculiarity in the process of refining I have not been able to determine. One thing, however, I have noted, namely, that if even a small quantity of a saponifying oil, such as olive, be mixed with the cotton seed oil it will convert it into a miscible oil with the alkalies.

The practical conclusion to my observations and experiments is this, that cotton seed oil from its sweetness and keeping properties is admirably adapted as a base for ointments and pomades, but is not suited for forming liniments with alkaline solutions.

The supply of cotton seed is obtained from several countries and may be said to be inexhaustible. The Southern States of North America contributing the largest quantity, which may be measured by millions of tons, a great proportion of which, owing to its bulk and distance from shipping ports, is not worth the expense of transit, is burned for fuel and given to cattle and pigs for litter. A considerable quantity is used in the manufacture of decorticated cotton cake and oil, both of which find a ready sale in this country. Very little of the seed, however, in its natural state, finds its way to our markets; but a new process of clearing the seed is being prosecuted with considerable success, and it is fully expected that in a few years a large quantity of this cleared seed will be shipped to this country. Egypt may be said to be the principal source from which this country derives its supply, the quality of which is much superior to that grown in the American States. The quantity shipped from Egyptian ports, on an average of years past, is something like 250,000 tons. Improvements in the method of irrigation are said to have increased the quantity last year by 50,000 tons, and it is reported that these works are being improved and extended this season with equal success. India and the South Sea Islands also send their quota of seed to our markets.—*Phar. Jour. and Trans.*, Sept. 19, 1885, p. 250.

REPORT ON THE ACTION OF PAPAIN.¹

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In a previous paper ("Journal of Physiology," Vol. v, No. 4) I have detailed the characters and action on coagulated albumen of the proteolytic ferment obtained from the papaw-juice (*Carica Papaya*), extending the researches of Wurtz and Bouchut and others.

Wurtz had described the ferment as a proteid, soluble in distilled water, yet precipitated by nitric acid, but differing from a native albumen (as white of egg) in not being precipitated by boiling. In the material I used in my former experiments (commercial papain) I found two proteids, a globulin and a "peptone;" and I could not come to any conclusion as to which of these bodies was the ferment, or, to speak more correctly, which was associated with it.

¹ From the Physiological Laboratory, University College. Reprinted from the "British Medical Journal," July 25, 1885.

In the present investigation I attempted to settle this point. In the first place, the body called a "peptone" in my previous paper is not a true peptone—that is, a proteid capable of fairly rapid diffusion, not precipitated by nitric nor by acetic acid and ferrocyanide of potassium; but it is one of the bodies intermediate between globulins and peptone, first described by Meissner as a peptone, and called by Kuhne *hemialbumose*. This body agrees with peptone in the following reactions: It is soluble in distilled water, and is not precipitated from this solution by boiling; it also gives a pink or red color with copper sulphate and excess of potash. It differs from peptone in being precipitated by strong mineral acids, and by acetic acid and ferrocyanide of potassium. These reactions agree with those given by Wurtz as characteristic of solutions of pure papain; this agreement, indeed, led me to think that the ferment was associated with the hemialbumose. I found this to be the case. A glycerin extract was made of commercial papain, the glycerin being filtered clear under pressure. This extract contained a proteid (hemialbumose) in quantity and a mere trace of globulin. It was as active as the powder itself. Part of this extract was diluted with water, and saturated with magnesium sulphate to precipitate the small amount of globulin, which was filtered off; the filtrate was then saturated with sodium sulphate, which precipitated the hemialbumose. This was collected on a filter, washed with a saturated solution of sodium-magnesium sulphate, and then dissolved in water. This solution of the precipitated hemialbumose was found to be very active; it was tested with coagulated egg albumen, peptones being formed in quantity. The filtrate, after saturation with sodium sulphate, contained a little hemialbumose. After dialyzing for some hours, its action was tested on egg albumen; very little, if any, digested. This experiment distinctly shows that the ferment action is associated with the hemialbumose.

The result was confirmed in another experiment, in which a similar process of saturation was performed in a watery solution of papain. The result may be tabulated as follows:

Precipitate by magnesium sulphate = globulin.	Precipitate by sodium sulphate = hemialbumose.	Filtrate containing no proteid.
No action on coagulated egg albumen at 35° to 40°C.	Forms peptones from coagulated egg albumen at 35° to 40°C.	No action on albumen at 35° to 40°C.

Whether the ferment may be separated from the hemialbumose I am, at present, unable to state. Ptyalin (Cohnheim) and pepsin (Brücke) have been separated free from proteid. Trypsin, however, has not, though Schützenberger states that probably all diastatic and proteolytic ferments may be separated from the accompanying proteids.

I have repeated the experiments on animal albumen detailed in my first paper, and can only confirm what I have there stated, namely, that papain acts like trypsin (though not so rapidly) in forming from coagulated albumen and fibrin a true peptone, an intermediate body related to globulin, and leucin and tyrosin.

I have extended my experiments to the investigation of the action of the ferment on milk, and on the proteids found in papaw juice.

Action on Milk.—Papain acts like pancreatic juice on milk, and the experiments I shall describe are almost similar to those performed by Dr. W. Roberts, of Manchester, with pancreatic extract. Papain, like pancreatic extract, first curdles the milk, and, within certain limits of temperature, the curds are more quickly formed and are larger the higher the temperature up to 62°C. (about 145°F.), at which point the curdling is practically instantaneous; for example, with 5 grains of papain, and 450 cc. of milk, and 125 cc. of water at 62°C.

The curdling is hindered by making the milk alkaline with bicarbonate of soda, by diluting it, and also, to some extent, by boiling the milk previously to the addition of an equal quantity of cold water; when, if papain be added, the curdling is not so great, nor the curds so large, as when the water is boiled and added to the milk. The curds in "papainized" milk gradually dissolve, the casein being changed into peptones, leucin and tyrosin being produced, and the liquid becoming bitter to the taste. Moreover, between the stage of casein and peptone there is a body formed, which is precipitated by boiling and by nitric acid, an intermediate body similar to the one developed during the digestion of coagulated egg albumen. Its properties were tested as follows: Seeing that it must be formed from the curds first precipitated by the ferment, these were separated in one experiment, and extracted with a 10 per cent. sodium chloride solution, and the mixture filtered. The clear filtrate gave a fine precipitate on boiling, and on adding nitric acid; and, moreover, a fairly copious one on saturation with sodium chloride. This last precipitate was collected and dissolved in water (by aid of the salt present), and gave the following reactions, in addition to those previously obtained

from the unsaturated filtrate, namely, a marked biuret reaction with copper sulphate and potash, and a cloudiness with corrosive sublimate, insoluble in excess; boiled with fresh ferric acetate and filtered, no proteid was found in the filtrate, showing the absence of peptones. Hence this body, which is soluble in saline solutions, and precipitated from these by saturation with sodium chloride, and giving a biuret reaction, is a hemialbumose.

This point being settled, experiments were done to see the degree of action of the ferment in the milk. In the following experiment, the digestion of the curds (casein and fat), obtained by precipitating 200 cc. of milk diluted with glacial acetic acid, was compared with that of the same quantity of milk. The curd was well washed, to free from acid, and squeezed as dry as possible before weighing.

A.

Milk.....	200 cc.
Sodic carbonate.....	·5 gram ($7\frac{1}{2}$ grains).
Water.....	200 cc.
Papain.....	·3 gram (5 grains).

The water and sodic carbonate were boiled and added to the milk (which was at $10^{\circ}\text{C}.$); resulting temperature, $50^{\circ}\text{C}.$ The papain was then stirred in the beaker, wrapped up, and kept in a warm place. In ten minutes the mixture began to curdle, the curds gradually dissolving; in forty-five minutes, a slight bitter taste was developed; in fifty minutes, the temperature of the liquid was $35^{\circ}\text{C}.$ It was then boiled, causing a slight precipitate. The filtered liquids gave the tests for peptones.

B.

Curd prepared as above from 200 cc. of milk; weight	21·5 grams.
Water.....	200 cc.
Sodic carbonate.....	·5 gram ($7\frac{1}{2}$ grains).
Papain.....	·5 gram ($7\frac{1}{2}$ grains).

Half the water was boiled and added to the other half, containing the curd and sodic carbonate; resulting temperature $48^{\circ}\text{C}.$ It was placed in a warm place under cover for sixty-five minutes, when the residue of curd weighed only 2·7 grams; therefore $(21\cdot5 - 2\cdot7) = 18\cdot8$ grams digested. The residue was chiefly fat; it dissolved almost completely in ether. The filtrate after digestion gave a slight precipitate with acetic acid in the cold, soluble in excess; none on boiling; a marked biuretic reaction with copper sulphate and potash.

It will be noticed that A was partly digested, giving a precipitate on boiling; B almost completely so, since there was no precipitate on boiling. The precipitate by acetic acid, soluble in excess, was hemialbumose. Both A and B were slightly bitter after digestion.

The point naturally suggested by these experiments was that papain might be utilized in preparing an artificial peptonized milk, its slower action being in some respects an advantage over pancreatic extract, in that the digestion can be arrested at any intermediate stage more readily. In some conditions of disease, it seems to me a distinct advantage to employ a partly digested food, because some work is left for the stomach to accomplish; in others, perhaps, a fully peptonized food would be more useful.

By a partly digested milk is meant one in which much of the casein is in an intermediate stage, namely, as "metacasein" and hemialbumose; by a fully digested milk, one where all of the casein has been changed into peptone. A and B, in the experiments quoted above, are types of the two stages.

Milk which has undergone only partial digestion is not very bitter, but has the disadvantage that it causes a precipitate on boiling afterwards. The latter result may be obviated by making it sufficiently alkaline, that is, adding 30 or 40 grains of bicarbonate of soda to the pint of milk. It is only slightly different in appearance from ordinary milk. The wholly digested milk is more bitter.

The following practical suggestions may be made regarding the preparation of papainized milk:

A pint of milk is taken, and a quarter of a pint of water; add an equal volume of milk to the water, and 30 grains of bicarbonate of soda, and boil; add the remaining milk to the hot liquid. The resulting temperature varies from 45° to 55°C.; it is usually about 48°C. (118°F.); the variation depends, of course, on the temperature of the cold milk. The papain must now be quickly stirred in, and the mixture covered with a cover, and placed in a warm place. After digestion it is boiled to stop the action. This method does as well for pancreatic as for papain digestion; it obviates the use of a thermometer, and so can readily be done in the ward or sick room.

For preparing a partly digested milk, 7 grains of papain, with an hour and a half's digestion, is quite sufficient, using a pint of milk in the manner above described; for the more complete digestion, 10 grains for two hours must be used.

The food is greedily taken by kittens, but I have not yet tried it on patients.

Action of Papain on the Proteids in Papaw Juice.—(Only a brief summary of the results obtained can now be given; full details of the experiments will soon be published.) Of late years the former ideas of the nature and constitution of vegetable proteids have been entirely revolutionized, chiefly by the researches of Denis ("Mémoire sur le Sang"), Weyl, Hoppe-Seyler, Vines, and others; so that now we may state that the two chief proteids found in plants are globulins and "peptones." Vines considers that there is no true peptone in the seeds of plants; he thinks it is a hemialbumose, and explains away Ritthausen's "legumin" and "conglutin," obtained from the seeds of *Leguminosæ*, referring the former to the class of hemialbumoses, and the latter to a changed form of proteid produced by the action of alkalis on globulin. ("Proc. Roy. Soc.," vol. xxviii, 1878.) By pursuing the method first instituted by Denis, namely, extracting the material with 10 to 15 per cent. solution of sodium chloride, and precipitating the proteids by saturation with the salts, I have obtained from papaw juice proteid bodies, whose reactions agree with those of globulins and hemialbumoses, or rather albumoses, leaving the question as to whether they are anti- or hemia- forms for further consideration. The salts used in saturating were *magnesium sulphate*, which precipitated the globulins of the myoscin type and two forms of albumose; followed by *sodium sulphate*, which, by forming the double salt sodio-magnesium sulphate, precipitated the remaining proteids, which consisted of a trace of vegetable vitellin and an albumose (Kuhne, 'Ueber Albumosen,' "Zeitschr. für Biologie," Band xx, 1884).

The albumose precipitated by sodio-magnesium sulphate corresponds to Vines's hemialbumose; its exact position I must leave for the present undetermined. This albumose gives the same reactions previously detailed, as those of the body with which the ferment is so closely associated; it is the proteid in the juice most like a peptone. I found no true peptone.

The action of papain on these different constituents is peculiar, because in the many experiments I have hitherto done, I have been able to discover no true peptone as a result of digestion; the body which is formed from the globulins is the albumose found in small quantities in the salt extract, the body which corresponds to Vines's hemialbumose.

At the same time, leucin and tyrosin are formed from these proteids; they are found in the juice as well.

I must thank Messrs. Christy & Co. for their kindness in supplying me with specimens of papain, and of dried papaw juice.—*Phar. Jour. and Trans.*, Aug. 8, 1885, p. 129.

SEMEN CEDRONIS.

BY C. HARTWICH.

Several genera of the family Simarubaceæ are distinguished by the large quantity they contain of intensely bitter substances, which, so far as is known, may be all identical with or nearly allied to the more exactly investigated quassiin. It is to the presence of these substances that is due almost exclusively the medicinal use of different parts of these plants, especially in former days, and which is still tolerably wide spread in the present time. For instance, the wood from *Picroena excelsa*, Lindl., and *Quassia amara*, L., are used, and the root bark of *Simaruba officinalis*, DC.,¹ and *S. medicinalis*, Endl. According to Fremi, the flowers also of the *Quassia amara* are in favor with the natives as a remedy against disorders of the stomach.² Further, Flückiger has referred to the high quassiin contents of the seeds of *Samadera indica*, Gaertn., without, however, mentioning any medicinal use of them. In Brazil the freshly pressed juice of *Simaruba versicolor*, S. Hil., is used as a remedy against skin parasites.³ Further, in the same country the fruit of *Simaba Waldivia* enjoys a great reputation on account of its healing action.

To this latter genus belongs also the *Simaba Cedron*, Planch.,⁴ yielding the seeds that are the subject of the present note, which have long been known and formerly enjoyed an unmerited reputation, but afterwards fell almost into oblivion. These seeds have again recently frequently appeared in commerce as a remedy in stomachic disorders. Their reputation in former times was due to the beneficial action attributed to them in fevers and snake-bites. In the latter respect it is even now believed in Costa Rica that they not only have a healing

¹ The bark of this tree is used in British Guiana for tanning.

² "Pharmacognosie," 2d ed., p. 461.

³ "Jahresbericht," 1880, p. 35.

⁴ In Brazil the seed of *Simaba ferruginea*, St. Hil., is called "cedron" ("Amer. Jour. Phar.," Feb., 1880).

effect when taken by a bitten person, but it is said the exhalation from people who for a time drink a liqueur prepared from the seed or the bark acquires such an odor that poisonous snakes, insects and spiders are scared by it. But it is now recognized that an antidotal action against snake-bite does not exist in the seeds, whilst their antifebrile properties appear also very problematic. Du Coignard observed that the Indians of New Granada used 95 grams of the seed with effect during the cold shiverings, and he himself obtained results with them where quinine had failed, but he confesses that the activity of the seeds was not uniform. Other observers could recognize no action at all. Whether, as has recently been affirmed, the drug is a remedy against insanity, is probably also open to doubt.

The plant occurs in New Granada, especially along the Magdalena river. Polakowsky brought the seeds from Costa Rica, where the plant, according to his statement, grows in the hot lowlands of the coast district on the western side of the republic. He mentions also the statements of Scherzer and Wagner that it is frequent in the woods on the eastern side. It appears, however, to extend considerably further north, since seeds were exhibited in Berlin, in 1883, from Mexico.

The seeds have long been known; according to Lindley they were mentioned as far back as 1699. The tree was discovered in 1846, by Purdie, and described by Planchon. It attains a height of 6 metres, and the stem a diameter of 15 to 25 centimetres. The pinnate leaves are smooth, at least 60 centimetres long, consisting of at least twenty leaflets, and are alternate or opposite; the leaflets are sessile, 10 to 15 centimetres long, acuminate and penninerved. The common petiole is cylindrical, and terminated by an odd leaflet. The racemes are 60 centimetres long or more, densely crowded, strongly branched, covered with a short velvety reddish down. The calyx is small, cup-shaped, with five obtuse teeth, and an ochreous down. The corolla has six [according to Planchon five] spreading, pale brown petals, downy externally. Ten short stamens stand behind a similar number of scales, which approximate to form a tube. Carpels five; styles five, above the base, and longer than the stamens; one ovule in each carpel. The fruit is very large, one-seeded by reason of the abortion of the other carpels, berry-like, ovate, oblique at the top; the fleshy part of the fruit, which does not appear to be very soft, is enclosed in a horny endocarp. Seeds very large, suspended, covered with a membranous integument, with a very

distinct chalaza; no endosperm; cotyledons very large, in the fresh condition fleshy and white.

Only the cotyledons are met with in commerce. They are 3 to 4 centimetres long, 1.5 to 2.5 centimetres broad, longish ovate, rounded on one side; on the other side, straight or even somewhat reniform indented, ridged on the outer surface, smooth on the inner. At one end the cotyledons are notched in a peculiar manner, a fissure that begins nearly at the top of the ridged side running right and left for about $1\frac{1}{2}$ centimetres and separating two semicircular pieces of about 2 millimetres in diameter. To this notch corresponds a point on the inner flat side of the cotyledon, which, according to Vogl, is the residue of the radicle. In a transverse section are seen upon the convex side five or six faint vascular bundles; the remainder of the tissue consists of uniform polyhedric cells, which appear to be pressed together and elongated tangentially. The contents consist of tolerably large roundish oval starch granules. In addition albumen can be detected, especially in a layer lying next the cell wall, and traces of fat.—*Phar. Jour. and Trans.*, Aug. 8, 1885, p. 127, from the *Archiv der Pharmacie*, cciii, 249.

ADONIS VERNALIS AND ADONIDIN.¹

BY JEHAN MORDAGNE.

The *Adonis vernalis*, nearly unknown in modern therapeutics until recent years, has been rescued from oblivion by the clinical and physiological experiments of Bubnoff, in 1880, and the researches of Cervello, in 1882, upon the active principle of the plant and its physiological action. As a result, the plant has been utilized as a substitute for digitalis in the treatment of affections of the heart.

Taking up the researches of M. Linderos, who had detected the presence of aconitic acid in the plant in the state of aconitate of lime and of potash, and those of Dr. Cervello, who discovered in it a new glucoside that he named "adonidin," the author of the present paper has occupied himself principally with the latter body.

The parts of the plant operated upon were the leaves and stalks, and the process is described as follows. The leaves and stalks, after

¹ Abstract of a paper published in the "Bulletin de la Société de Pharmacie du Sud-Ouest" for July.

being exposed to the air and dried in a stove at 40°C . for several days, lose one-fifth of their weight of water. They are next macerated during five days, with about five times their weight of 50° alcohol; the liquor is then decanted off, and the spirit removed by distillation. The residual liquid is now treated with subacetate of lead, which causes the formation of a rather voluminous yellowish precipitate that carries down with it a certain quantity of coloring matter and aconitic acid as aconitate of lead. This is removed by filtration, and the filtrate treated with solution of carbonate of soda to remove excess of lead. The resulting brown solution is rendered alkaline with a few drops of ammonia solution, and then the glucoside is precipitated from it by means of a strong solution of tannin. This precipitation is not effected, or only incompletely, in an acid liquor. The tannate of adonidin so obtained is fairly abundant, yellowish grey in color, and soluble in a large quantity of water; its bitterness is characteristic. The tannate is dried between two papers and mixed intimately with very pure finely pulverized hydrate of zinc or hydrate of lead, so as to form a homogeneous powder. This is suspended in 90° alcohol, which is gently heated during several hours in an apparatus fitted with a return condenser. Or the tannate and the hydrate of zinc may be treated together with the alcohol in a capsule until the disappearance of the liquid; but the former plan has given the author the best results, the spirit being driven off afterwards in a water-bath. The residue is then treated with absolute alcohol and the mixture filtered. The resulting alcoholic solution of adonidin is treated with charcoal, so as to remove as much as possible the brown color, and then ether is added, which causes the precipitation of some foreign matters, as well as traces of adonidin. Finally, it is cautiously evaporated and the residue, spread out in thin layers, is exposed in a vacuum together with chloride of calcium or sulphuric acid.

The preparation of the glucoside is long and delicate, in consequence of the readiness with which bodies of this class undergo decomposition. The points insisted upon by the author are: (1) preliminary and thorough treatment with subacetate of lead, which removes a great part of the coloring matter, as well as a pitchy product, probably resulting from the resinification of an essential oil observed in the leaves; (2) elimination of excess of lead by carbonate of soda; (3) precipitation of the tannate from an ammoniacal solution; (4) intimate mixture of the tannate with the oxide of zinc; and (5) the avoid-

ance of too high a temperature in operating upon the alcoholic solution of adonidin, which would give rise to a deeper brown color.

Chemical and Physical Characters of Adonidin.—Adonidin generally occurs in the amorphous state, but after a long desiccation the author has obtained a substance presenting a diffuse and radiating crystallization. Ammonia vapor is sufficient to put a stop to this crystallization. The adonidin, spread in a thin layer on a plate, requires to be kept under an exhausted bell glass in the presence of sulphuric acid for at least a month in order to obtain a product relatively dry and it then forms a rather hygroscopic canary-yellow powder.

The taste of this glucoside is very freely bitter, and it is difficult to remove from the mouth the decided bitterness it provokes.

Adonidin is rather soluble in water, though it requires a short time to undergo a complete solution. Alcohol and amylic alcohol also dissolve it in the cold. On the other hand, it is insoluble in anhydrous ether, chloroform, oil of turpentine, and benzin. It retains sufficient water to render it necessary, before using it for an elementary analysis, to dry it at a temperature below 100°C.

The quantity of adonidin contained in the *Adonis vernalis* is small, ten kilograms scarcely yielding two grams of dry substance. The glucoside exists even in the rhizomes and rootlets of the plant, but insufficiency of material has prevented the author from determining in what proportion.

Adonidin, when heated in a current of dry air in an oil-bath at a temperature between 80° and 85°C. until the weight was constant, lost 3.14 per cent. of its weight of water, but underwent no perceptible change in its physical properties. Between 85° and 90° it became browner in color, and at 100°, nearly black. Upon ignition it gave off a vapor with a very penetrating and persistent odor, comparable to that of cut hay.

Adonidin is a neutral body, solutions having no other action upon litmus paper than imparting to it a yellowish tint. Under the influence of ammonia the glucoside browns somewhat intensely. A solution heated with potash is sensibly decolorized, and in the mass of the liquid may be observed the formation of yellow resinous corpuscles, insoluble in water. Baryta gives with adonidin no appreciable precipitate, and it is impossible to recognize the evolution of any ammoniacal odor. Subacetate of lead produces a certain cloudiness in solutions of the glucoside. Tannin produces in dilute solutions an abun-

dant precipitation of tannate. The ordinary alkaloidal reagents produce neither coloration nor precipitate. When a solution is heated with Fehling's solution at first only a green color results, due to the combination of the blue and yellow liquids; but if a few drops of hydrochloric acid be added, and the heating be continued, the cupropotassic liquid undergoes reduction. The product of this decomposition has not been specially studied by the author. Whatever this may be, when the adonidin is decomposed there is a precipitation of a small quantity of resinous matter, soluble in ether, whilst at the same time a very sharp and persistent odor is developed, that may be compared, as before stated, to cut hay.

When ignited on platinum foil adonidin burns without leaving a trace of residue. The author failed to detect the presence of nitrogen in the pure glucoside. Twenty centigrams heated with potassium yielded no trace of cyanide.

The imperfect crystallizability of adonidin and its readiness to undergo decomposition have hitherto prevented the author from making a satisfactory elementary analysis upon which to base a formula; but he gives the following centesimal composition as the mean of several experiments: C=42.623; H=7.547; O=49.830.

Pharmacology.—The author concludes his paper with a section on the pharmacology of the plant. As the posology is as yet incompletely worked out, this is necessarily imperfect. Taking, however, as a basis the doses of infusion administered by Bubnoff to his patients, the author gives the following formulæ for preparation:

Infusion of Adonis Vernalis.

Dried leaves and stalks.....	2 grams.
Distilled water.....	100 “

Boil the water and pour it upon the herb, and allow it to infuse for about ten minutes.

This infusion constitutes a clear chestnut-brown solution, with a yellow fluorescence. The taste is at first barely perceptible, the first sensation experienced being that of a slightly sweetened liquid; but if the contact with the palate be continued a very disagreeable and especially persistent bitter becomes perceptible.

Aqueous Extract of Adonis Vernalis.

Stalks and leaves.....	500 grams
Distilled water.....	4,000 “

Make first an infusion with the entire quantity of the drug and three litres of boiling water, and allow the whole to stand in contact for about twelve hours; then decant and pour the fourth litre of boiling water on the drug. After two hours' infusion the two liquors are united and evaporated in a vacuum over a water-bath.

An average of three operations yielded 145 grams of aqueous extract for 500 grams of substance employed. Respecting the dose, the author calculates that as the quantity of infusion given by Bubnoff in twenty-four hours represented 4 grams of stalks and leaves in 180 grams of water, and as the 500 grams of the stalks and leaves yielded 145 grams of aqueous extract, the quantity of this extract corresponding to Bubnoff's daily dose of infusion would be 1.10 gram. Of course, however, these proportions would require to be confirmed by clinical experience.

The extract has the ordinary appearance of extracts; it is black, but brown by transparence. There is nothing peculiar in the odor, and it is entirely soluble in water. Diluted with an equal quantity of water it gives an olive-brown precipitate with phosphotungstate of soda. Subacetate of lead produces a yellowish white precipitate, whilst caustic alkalies cause the color to become brighter. When dissolved in a large quantity of liquid it imparts to it a dirty yellow color. It is very bitter.

Hydroalcoholic Extract of Adonis Vernalis.

Stalks and leaves.....	500 grams.
Alcohol (60°).....	3,000 “

Macerate the finely chopped herb during two days in the alcohol, decant the liquid, distil off the spirit and evaporate in a vacuum over a water-bath to a syrupy consistence. At this point some tarry and resinous products, which are insoluble in water, may be seen floating on the surface. The author has obtained good results by taking up the extract again with distilled water, filtering and evaporating afresh to a homogeneous mass.

The characters of this extract differ from those of the aqueous extract. It is soluble in water, and has a bitter taste and an empyreumatic odor. The aqueous solution gives with subacetate of lead an abundant precipitate, which, according to Linderos, would contain aconitate of lead. Phosphotungstate of soda produces a persistent turbidity, whilst the caustic alkalies brighten up the brown color and give it a tendency towards green. The yield of this extract is practically the same as in the case of the aqueous extract; on an average at least 250 grams may be expected from a kilogram of the plant.—*Phar. Jour. and Trans.*, Aug. 15, 1885, p. 145.

ESTIMATION OF THE ALKALOIDS IN THE LEAVES OF *ATROPA BELLADONNA*.¹

BY PROFESSOR WYNDHAM DUNSTAN AND FRANCIS RANSOM.

In a previous communication to the Pharmaceutical Society, which formed the first part of this inquiry, we described a simple process for the estimation of the alkaloids in the root of the *Atropa Belladonna*, which consisted in extracting the root with a mixture of chloroform and alcohol, and removing the alkaloidal salts from this mixture by agitating it with water. From the aqueous solution the alkaloids are liberated by ammonia and removed by chloroform. That the alkaloidal residue obtained in this way consisted of pure alkaloid was proved by the precipitation of a certain quantity in the form of the periodides and by the recovery of the original quantity of the free bases from these salts. It was experimentally shown (1) that the root was entirely exhausted of alkaloid by the solvent; (2) that no loss of alkaloid occurred during the subsequent purification of the liquid; (3) that the final residue was wholly alkaloidal. In every similar inquiry it is necessary that these three points be individually established by experiment. The foregoing process has since been employed by other workers for the purpose of estimating the alkaloidal value of belladonna root. In continuing the investigation with the aid of a further grant from the Conference, we have sought, in the first place, to devise a reliable and convenient process whereby the alkaloids could be isolated without loss in a pure state from the leaves of the *Atropa Belladonna*. For this purpose the method which had proved so successful with the root of the plant had to be considerably modified. Great difficulties were experienced in the extraction of the whole of the alkaloid from the leaves, and in the subsequent separation of the alkaloid from the mixture of fat and chlorophyll. Without describing in detail the results of the numerous experiments which were instituted, the following conclusions may be summarized. In extracting the leaves absolute alcohol alone is to be preferred to a mixture of alcohol and chloroform. By continuous percolation with boiling absolute alcohol the leaves can be freed from every trace of alkaloid. This was proved by showing that the leaves after this treatment yielded no alkaloid either when boiled with dilute hydrochloric acid, or when mixed with

¹ Read before the British Pharmaceutical Conference.

lime and extracted with chloroform. From the extract which is obtained by evaporating the alcoholic liquid it is practically impossible to wholly extract the alkaloid by means of water or even dilute hydrochloric acid. After many successive treatments with dilute hydrochloric acid considerable quantities of alkaloid still remain associated with the chlorophyll and fat, and even after several days' digestion, a solution of iodine in potassium iodide indicated the presence of more than traces of alkaloid. We have found that by far the best method of separating the whole of the atropine and hyoscyamine from the alcoholic liquid is to dilute it considerably with water acidulated with hydrochloric acid, and then to remove the chlorophyll and fat by repeatedly agitating it with chloroform. In this way an acid solution of the alkaloids is prepared, from which the free bases may be readily obtained pure by adding excess of ammonia and extracting the alkaline liquid with chloroform. It may here be observed that chloroform is by far the best solvent for extracting atropine and hyoscyamine from an alkaline liquid. Ether, quite apart from manipulative difficulty, is required in much larger quantity to effect the same result. It now remained to prove that the alkaloidal residue which was obtained by evaporating the chloroform was pure. This was done by the method that we have described in a previous paper. The residue is dissolved in dilute hydrochloric acid and then precipitated with a solution of iodine in potassium iodide. The periodides of the alkaloids obtained in this way are decomposed by sodium thiosulphate, and after ammonia has been added the alkaloids recovered from the liquid by means of chloroform. If the residue was pure the weight of the alkaloids obtained in this way should coincide, within the limits of experimental error, with the original weight of the residue. As examples, the following out of many results may be cited :

Residue taken.		Pure alkaloid found.
0.011 gram.	.....	0.010 gram.
0.0105 "	.....	0.010 "
0.0115 "	.....	0.011 "

On the foregoing experiments is based the following process for the estimation of the atropine and hyoscyamine in the leaves of *Atropa Belladonna*, a process which fulfils the three fundamental conditions that have been previously pointed out. Twenty grams of the dried and finely powdered leaves are well-packed in an extraction apparatus and exhausted with about 100 cc. of absolute alcohol. The alcoholic

liquid is diluted with about an equal volume of water made slightly acid with hydrochloric acid. The chlorophyll, fat, etc., are then removed from the slightly warmed liquid by repeatedly extracting it with chloroform until nothing further is removed by the solvent. The aqueous liquid is made alkaline with ammonia and the alkaloids extracted by chloroform, by evaporating which a residue of pure alkaloid is obtained, and dried by heating it at 100° until a constant weight is attained. We have not yet been able to make an extensive series of estimations of the amount of alkaloid which is contained in various specimens of belladonna leaves. A specimen of dried foreign leaves contained 0.22 per cent. of total alkaloid, and a specimen of English leaves which had been somewhat overheated in drying contained 0.15 per cent. We have reason to believe that both these specimens contain less alkaloid than English leaves which have been carefully grown and gathered. To these and other questions we may return at a future time.—*Phar. Jour. and Trans.*, Sept. 12, 1885, p. 237.

THE ALCOHOLIC EXTRACT OF THE LEAVES OF ATROPA BELLADONNA.

BY PROFESSOR WYNDHAM DUNSTAN AND FRANCIS RANSOM.

This extract, as far as we know, has not, up to the present time, received a chemical examination, and no attempt has hitherto been made to determine its alkaloidal value. In order to extract the alkaloids in a pure state from this highly heterogeneous mixture a great number of different methods have been tried, and the investigation has occupied a considerable amount of time. The extract was first dissolved in various liquids, and purification was then attempted. Among the liquids which were experimented with were chloroform, alcohol, ether, solutions of potassium and sodium hydroxide, and carbonate and dilute acids.

The difficulties which were encountered in attempting to isolate the alkaloids in a pure state were so great, owing to the large amount of fatty matter, chlorophyll, etc., which is present in the extract, that at one time it seemed impossible to effect this by any but a complicated process. However, by modifying the method which we have used for the estimation of the alkaloid in the leaves a reliable and simple process has been found. This consists in warming 1–2 grams of the extract

with dilute hydrochloric acid until as much as possible is dissolved. The mixture is filtered, preferably through glass or cotton wool, and the residue washed with hot dilute hydrochloric acid until nothing further is dissolved. The acid liquid is then repeatedly agitated with chloroform so long as anything is removed by this solvent. The acid liquid is made alkaline with ammonia and extracted with chloroform, which when evaporated and dried at 100°C., leaves a residue of pure alkaloid. This was proved by the method of precipitating with iodine, which we have previously described. The following are some of the results that were obtained :

Residue taken.		Pure alkaloid found.
0.029 gram.	.....	0.028 gram.
0.018 “	.....	0.017 “
0.011 “	.....	0.010 “
0.006 “	.....	0.005 “

The foregoing process, then, is a simple and satisfactory one for estimating the atropine and hyoscyamine in the green alcoholic extract of belladonna. It now remains to be shown with the aid of this process how far the extract as met with in commerce possesses a uniform alkaloidal strength. The analysis of a carefully prepared specimen showed the presence of 1.8 per cent. of atropine and hyoscyamine.—*Phar. Jour. and Trans.*, Sept. 12, 1885, p. 238.

THE APPOINTMENT OF AN EXAMINER OF DRUGS FOR THE PORT OF PHILADELPHIA.

The law of the United States requires that there shall be appointed a “special examiner” of drugs and medicinal chemicals at the port of Philadelphia. At New York this duty is performed under the law by an assistant appraiser.

The office of examiner being vacant in Philadelphia, by reason of the resignation of Dr. Lamb, the former incumbent, the appraiser of the port, Mr. J. B. Baker, requested the following gentlemen to examine and report upon the qualifications of the applicants for the position, viz., Charles Bullock, Robert England, A. W. Miller, M.D., and J. R. Angney, M.D.

As this appears to be the first time when applicants for this important position have not been chosen arbitrarily, a brief record of the course pursued may be of interest, and also furnish assistance for future occasions of a like character. Two of the above mentioned are retail pharmacists, and two are importers of drugs and chemicals.

The following general features were adopted :

1. The applicants to be known to the examiners by a number, and not by name ; all to be examined simultaneously.

2. The examination to be in writing ; the same questions to be submitted to each.

3. Specimens of imported drugs, of various qualities, to be submitted for recognition, and detection of adulterations.

4. The questions to be confined to materia medica and pharmaceutical chemistry, so far as was necessary to test the quality and purity of drugs and officinal preparations which are imported into this port.

It was deemed best to adhere to this outline, the original purpose of the office of drug inspector being to prevent the importation of damaged, adulterated, sophisticated, or worthless drugs and medicinal chemicals.

Although the drug examiner has been frequently employed as an appraiser in classification of products for duty, the committee did not deem it within their province to take cognizance of his duties in this position, but to regard him in his place as defined by the law creating the office.

The questions were so arranged that a numerical value, varying from 2 to 4, according to its importance, was attached to each subdivision. A correct determination of each specimen was marked 1. The relative numerical proportion to the questions and specimens was accordingly 85 to 15. In valuing the answers, the first three were examined and rated by one member, the next three by another member, the remaining four by a third member, and the determination of the specimens by the remaining member of the committee. Officinal names were not required, nor were errors in spelling taken into account. The plan gave uniformity in opportunity to the applicants, and equity in judgment upon their answers.

The examination was held at the U. S. Appraiser's Stores, Second and Gold streets, Saturday, October 12, at 10 A.M.

Two hours and a half were allowed for answers to the questions, and fifteen minutes for examination of the specimens. The committee determined upon an average of AT LEAST 50 per cent. as in *their* opinion necessary for making an applicant suitable for the position ; at the same time they agreed to report the averages of all the applicants examined, without recommendation of any. Nine applicants were selected by the appraiser. One retired on account of sickness. The result of the examination was as follows, the averages being given in the numerical order of the applicants :

Applicant No. 1 made an average of 51.25 ; No. 2, 54 ; No. 3, 35 ; No. 4, 44.75 ; No. 5, 42 ; No. 6, 55.5 ; No. 7, 60.5 ; No. 8, 41.5.

The questions and a list of the specimens are annexed :

Answers from any recognized authority will be received to these questions, though they are based on the authority of the U. S. Pharmacopœia.

NO. 1. OPIUM.—1. In what countries is opium largely produced? 2. What variety is chiefly imported into the United States? 3. What percentage of morphine should opium in its moist condition contain? 4. Give a process for the assay of opium. 5. Name a test for the purity of morphine.

NO. 2. CINCCHONA.—1. What countries produce the barks of commerce? 2. What varieties are officinal in the U. S. Pharmacopœia? 3. What alkaloids are contained in the bark? 4. What is the minimum percentage of

alkaloids which the bark should contain? 5. Give a short process for the assay of the bark. 6. What other bark is used for the manufacture of quinia?

NO. 3. JALAPA.—1. Describe the drug. 2. Give its source. 3. By what means can a good article be determined?

NO. 4. ALOE.—1. What varieties are found in the market? 2. How can an adulteration with resin be detected?

NO. 5. ERGOTA.—1. Describe the characteristics of good ergot.

NO. 6. ASAFETIDA.—1. Whence is it obtained? 2. Name its chief constituent. 3. Describe its physical properties. 4. What are its chief adulterations? 5. What percentage should be soluble in alcohol?

NO. 7. SCAMMONIUM.—1. Give a description of the drug. 2. On what constituent does its medical property depend? 3. Give a test for the purity of this constituent. 4. What are its most common adulterations?

NO. 8. ACIDUM CITRICUM.—1. What is the source of commercial supply? 2. Describe its physical properties. 3. What impurities is it likely to contain? 4. Give the tests for its purity.

NO. 9. CREAM OF TARTAR.—1. How is cream of tartar obtained? 2. What acid does it contain? 3. What are the usual impurities? 4. Give tests for its purity. 5. What is its official title?

NO. 10. SULPHUR.—1. Whence is it chiefly obtained? 2. In what three forms is sulphur official? 3. What adulteration is precipitated sulphur likely to contain? 4. How may that adulteration be detected?

SPECIMENS.—Give the name of each specimen submitted, and state any adulteration you may recognize.

No. 1. Colombo root, mixed with bryonia.

No. 2. Cream of tartar, in crystals.

No. 3. Senna, Tinnevely.

No. 4. Senna, Mecca, with stems and pods.

No. 5. Senna, East India.

No. 6. Uva ursi.

No. 7. Buchu, short leaf.

No. 8. Buchu, long leaf.

No. 9. Borax, in crystals.

No. 10. Carbonate of soda (sal soda).

No. 11. Aconite root, mixed with black snake root.

No. 12. Arnica flowers.

No. 13. Pimenta.

No. 14. Cubebs.

No. 15. Black pepper.

VARIETIES.

ACID TRICHLORACETIC, A NEW ANTISEPTIC.—*Trichloroacetic acid* ($\text{CCl}_3\text{CO}_2\text{H}$), according to Dr. Filippowitch, is a powerful antiseptic even in 0.2 per cent. solutions, while in 1 per cent. or 2 per cent. solutions it destroys all forms of organic life; in 5 per cent. it does not arrest the growth of yeast, but does that of bacteria and micrococci. In comparing its antiseptic power with that of other well-known agents, the author obtained the following scale of decreasing intensity; Corrosive sublimate, carbolic acid, trichloroacetic acid, chloride of zinc, borax, and permanganate of potassium. Trichloroacetic acid is a crystalline body, readily soluble in water and alcohol, and of an agreeable odor. It coagulates albumen, and its

concentrated solutions are caustic. Diluted solutions produce a hypersecretion of saliva, and destroy entirely the power of the saliva of converting starch into sugar and arrest the digestive action of pepsin; in concentrated solutions it precipitates pepsin and peptones. The author has employed this substance as an antiseptic remedy in various affections. Putrid and indolent wounds under the application of dressings soaked in weak solutions (which are entirely unirritating), are soon covered with healthy granulations and rapidly heal. It is also an excellent remedy in erysipelas and in the treatment of the fissures of the skin which often occur in cedematous parts, while in the treatment of venereal sores it is not inferior to iodoform. Internally, trichloroacetic acid has been used by the author in cases of gastric catarrh, where its employment produced amelioration of the symptoms; in the summer complaint of children, where it produced a cure; and in carcinoma of the stomach, with subsequent diminution of vomiting. For external use this remedy may be employed in 1 or 2 per cent. solutions; internally to adults 2 to 5 grains of the acid in very dilute solution may be given three times a day, while to children $\frac{1}{2}$ to 1 grain may be given four times daily. He also recommends this remedy as a preventive of cholera in doses of from 2 to 3 grains, three or four times daily.—*Gaz. Méd. de Paris; Quart. Therap. Rev.*, April, 1885.

THE COMBINED ADMINISTRATION OF BELLADONNA AND IODIDE OF POTASSIUM.—Aubert, ("Lyon méd.") affirms that the headache and coryza experienced after taking large doses of iodide of potassium may be entirely prevented by the judicious use of belladonna. In the case reported, eighty grains of the iodide were given daily, one grain of the extract of belladonna being administered in the evening. After a few days, the writer states, it is possible to suspend the use of the latter drug without any danger of a recurrence of the iodism.—*N. Y. Med. Jour.*

CALENDULATED BORIC ACID is recommended by Dr. Charles H. Burnett, by insufflation for the middle ear, in cases of chronic suppuration; it is made as follows: Triturate together equal parts by weight of boric acid and tincture of calendula. Evaporate the calendula down in a water-bath, at a temperature of about 150° F., to a pasty consistence, and then mix with one-half the boric acid; evaporate to dryness, add the other half and triturate. This is mixed with twice its weight of pure boric acid, and further triturated when it is ready for use.—*N. Car. Med. Jour.*, April, 1885.

MINUTES OF THE COLLEGE.

PHILADELPHIA, September 28, 1885.

The Semi-Annual Meeting of the members of the Philadelphia College of Pharmacy was held in the Hall of the College, this day, at 3 $\frac{1}{2}$ o'clock P.M., Charles Bullock presiding. Twenty members present. Minutes of previous meeting, as well as minutes of Board of Trustees for July and September, were read, and on motion adopted and approved.

Report of the delegates to the recent session of the American Pharmaceutical Association was made by the Chairman, Alonzo Robbins, as follows :

To the Philadelphia College of Pharmacy :

The undersigned, Chairman of the Delegation elected to attend the thirty-third annual meeting of the American Pharmaceutical Association, at Pittsburg, Pa., respectfully reports as follows :

The sessions were held in Lafayette Hall, and a large number of members were in attendance. Joseph Roberts, of Baltimore, Md., was elected President for the ensuing year. Providence, R. I., and the first Tuesday of September, 1886, were selected as the place and time for holding the next annual meeting.

Owing to the great number of Associations sending delegates, a timely resolution was presented and adopted, that only delegates from Colleges of Pharmacy and State Pharmaceutical Associations would in the future be recognized in the appointment of the Committee on Nominations.

The adoption by the Association of the New York and Brooklyn Formulary, and the probability of its serving as the basis for an acceptable National Formulary of unofficial preparations, promises to relieve pharmacists from the annoyance and loss resulting from the use of a variety of formulas for the same preparation.

A large number of papers were presented in answer to queries, but owing to lack of time many of them were read only by title.

A resolution was adopted doing away with future exhibitions under the auspices of the Association. As the exhibition has unquestionably aided in attracting members to the annual meetings, and when held in a separate building in no way interfered with the work of the Association, the wisdom of its abandonment is not very apparent.

The meetings of the Association were held only in the mornings, the evenings being devoted to various social entertainments, and the afternoons to visits to a few of the numerous manufacturing establishments in the vicinity of Pittsburg. McKee's Glass Works, Armstrong's Cork Factory, the Edgar Thompson Steel Works, the Plate Glass Works, and the Works of the Pennsylvania Salt Company at Natrona, were all visited. These visits proved very interesting and instructive; in most of the establishments the operations carried on, having a direct bearing on their business, were of special value to pharmacists.

Preceding the meeting of the American Pharmaceutical Association, the National Retail Druggists Association held its annual meeting. The most important transaction of this body was the consideration of resolutions towards reorganization on the basis of delegations from the State Pharmaceutical Associations.

Respectfully submitted.

ALONZO ROBBINS, *Chairman.*

September 28, 1885.

Professor Sadtler, in compliance with a request of the Chairman, gave a highly entertaining verbal report of his observations of the Pharmaceutical Institutions of England and the Continent, gathered during his recent tour of travel. These descriptions were of the rooms of the Pharmaceutical Society of Great Britain, the "Ecole de Pharmacie" of Paris, the Pharmaceutical Institutes of Strassburg and Göttingen, and the Court Pharmacy of Munich, the latter presenting some features analogous to our free dispensaries of medicine, except that the royal personages, the Court officials and other dignitaries are included in the gratuity, and receive not only the ordinary medicines, but some luxuries in medication, without charge.

The terms of three members of the Board of Trustees expiring with this date, as also the yearly term of the Committee on Deceased Members, an election was ordered and Messrs. Gust. Pile and E. McC. Boring appointed Tellers. The names of the following gentlemen were placed in nomination :

Trustees (for three years).—William C. Bakes, Edward C. Jones, Wm. E. Krewson, Andrew Blair.

Committee on Deceased Members (for one year).—Chas. Bullock, Alfred B. Taylor, Gustavus Pile.

The Tellers announced as the result of the ballot the election of Messrs. Bakes, Jones and Krewson as Trustees, and of Messrs. Bullock, Taylor and Pile as Committee on Deceased Members.

No other business being presented, on motion, adjourned.

WILLIAM B. THOMPSON, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, October 20, 1885.

On motion of Mr. Andrew Blair, Mr. Robert England was called to the chair. The first business was the reading of the minutes of the last meeting, which on motion were adopted.

The Registrar exhibited an *improved label drawer*, designed to prevent the drawer being removed from the frame of the counter, and thus emptying it of its contents. Every druggist knows the loss of time and danger of having articles mislabeled in consequence of such accidents; the improvement consists in having movable slides, in which the drawer moves, but from which it cannot be detached; these in turn again are fastened to the frame of the counter; they support the drawer, even drawn out to its full extent. These drawers have been in use for more than a year by our fellow-member, Mr. C. H. Clark, Thirty-sixth and Race streets, and were made by Mr. Thos. H. Grigg, 3820 Lancaster avenue.

Prof. Trimble exhibited specimens of the *cochineal insect*, sent from Texas by Mr. Herman Schuchard, of San Antonio, a graduate of our College, class 1885; with the insects, which were of both sexes, the prickly pear plant was sent, and this contained patches of a white cotton-like substance, in which they were secreted.

Prof. Maisch exhibited some specimens of *false ginseng*; the first sample shown was obtained in 1881, and had no similarity in appearance to true ginseng; it was a rhizome of some monocotyledonous plant. The other sample seems to be the root of one of the umbelliferæ, but which he was unable to say; it is a fusiform root of the size and color of ginseng, but is not branched below.

Prof. Maisch exhibited a variety of specimens of *Spanish saffron*, upon which he based the paper published in the "American Journal of Pharmacy" for October, and explained the nature and characters of the admixtures and adulterations there described. Three specimens of absolutely pure saffron were exhibited; two of them were of Pennsylvania origin.

Mr. Wallace Procter exhibited a specimen of *cinnamon water* which was nearly two years old, and was made by the use of kaolin, instead of magnesium carbonate or precipitated phosphate of calcium; it was made from oil of cassia, and not with the oil of Ceylon cinnamon; the water prepared from the true cinnamon oil is very liable to change in appearance, and hence oil of cassia is most generally preferred.

Mr. Procter stated that he had recently made *gun cotton* by the process published by Mr. Pile in the Proceedings of the Pennsylvania Pharmaceutical Association for 1884. The peculiarity of the process is in the use of equal volumes of sulphuric acid, spec. grav. 1.835, and of nitric acid, spec. grav. 1.45, the latter of which is not easily obtained, but it is quite satisfactory in working; when the temperature has fallen to 95° or 100°F. the cotton is immersed for ten hours.

Mr. Pile stated that the strength of the nitric acid seemed quite important, as the sulphuric acid in uniting with a weak acid gave a much higher temperature, and he thought it owing to the amount of water uniting with the sulphuric acid; at a higher temperature pyroxylin is formed in a much shorter time, but more or less of the cotton is likely to be dissolved.

Prof. Runyon, of the California College of Pharmacy, was introduced to the meeting, and made a few remarks, stating that pharmaceutical meetings, besides the interest attached to the subjects brought forth, had a beneficial influence, and stimulated like meetings in other localities, and that their own meetings were often quite interesting and instructive.

There being no further business, on motion, adjourned.

THOS. S. WIEGAND, *Registrar.*

EDITORIAL DEPARTMENT.

COLLECTIONS AS A MEANS OF INSTRUCTION.—The intelligent examination of an object makes a deeper and more lasting impression on the mind than can be expected from mere descriptions, whether they be conveyed by lectures or by the reading of textbooks. In pharmacy a multitude of objects are in use, and the apprentice gradually becomes familiar with a larger or smaller number of the same in an empirical manner. The employer who takes an active interest in the welfare of his apprentice, endeavors to prepare the ground for his future usefulness, by teaching him the handling of the different implements and the various manipulations, commencing with the simplest, and gradually proceeding to the more difficult ones. In the meantime the apprentice has made the practical acquaintance of a number of chemicals, drugs and pharmaceutical preparations through his natural faculty of discrimination as regards shape, color, odor, taste, etc. But a systematic training in this direction is rarely possible while the actual demands of business tax body and mind almost incessantly during business hours; it is usually left to the opportunities afforded by a course in a pharmaceutical college.

Since pharmacy has to deal not with abstract things, but with a vast number of objects, it is evident that attentive listening to lectures and reading of suitable books will not by themselves thoroughly familiarize the student with the physical properties of these objects, nor with their inherent chemical and medical qualities. Lecture experiments and practical demonstrations supply the want in a measure, but not entirely. Practical instruction in laboratories goes a step farther; the student is lead to see and discriminate while operating with the test-tube or the percolator, and exact observations impress the mind with facts, precautions and with the

necessity for correct manipulation. Not only are full and precise conceptions attained thereby, but such continued systematic exercise must result in the growth of the natural powers of discernment and acquisition, and therefore in the culture of memory, as well as in an increase of actual knowledge in the place of mere information and memorizing. Each object handled intelligently in the manner indicated becomes then a fixed unit, and around this other information clusters, which cannot be acquired by the pharmaceutical student from actual observations, such as geographical distribution, commercial relations, medical properties, doses and the like.

For the thorough study of chemicals, drugs, and preparations so as to become familiar with their qualities, the handling and careful examination of them is indispensable. This opportunity should be supplied by the shops. But at the present time crude drugs and crystallized chemicals are not as generally, as in former years, kept on hand, but are often purchased in the crushed or powdered condition so as to be ready for immediate use. Even fluid extracts, extracts, plasters, and other galenical preparations are not infrequently procured from the manufacturer, and thus the facilities for home study, which every student should possess, are materially curtailed. The examination of specimens displayed on the lecture counter is in a measure, an offset to the disadvantage mentioned; but there, obviously, sufficient time cannot be afforded for more than a mere cursory examination. The cabinets connected with the Colleges may, to a certain extent, supply the want to those who have the leisure to examine them at convenient hours during the day; but since the specimens must be preserved in sealed vessels, the examination of the contents cannot be as thorough as would be desirable.

Societies of students organized for study and mutual assistance in their labors may accomplish much by the collection of specimens with the view of examining their characteristics, and even the individual student should procure for his studies such specimens of official articles in their natural condition as are not accessible in the ordinary routine of the business in which he may be engaged. Such specimens need not be bulky, provided they are characteristic, and with a little exertion they may be procured. We know many instances where such collections have been made by students, and have been used to a good purpose, and we think that if obtainable at reasonable rates, they would be procured by a goodly number. On various occasions we have endeavored to interest parties in the getting up of small cabinets for students' use; but the labor connected with it, for which a suitable recompense can scarcely be expected, seems to have operated against its accomplishment. We are, therefore, pleased to learn that in at least one line such cabinets may soon be obtained, since Messrs. Parke, Davis & Co., of Detroit, are preparing a student's collections of vegetable *Materia Medica* which will be sold at a reasonable price. There can be no doubt of its usefulness to students, and that it will materially aid them in their studies; and we hope that similar collections of chemicals and pharmaceuticals may soon become accessible in like manner, embracing either all of each class that have been admitted into the pharmacopœia, or excluding the commonest ones that are likely to be found in every store.

THE AMERICAN JOURNAL OF PHARMACY.

DECEMBER, 1885.

PILLS AND EXCIPIENTS.

BY THOMAS S. WIEGAND, PH. G.

Read at the Pharmaceutical Meeting, November 17, 1885.

In the August number of the "Chicago Pharmacist" there appeared a paper upon pills, by Mr. Joseph Ince, taken from the "Pharmaceutical Journal and Transactions," of London. This with the examination of some pills of mercurous iodide, to which my attention had been directed, induced me to bring the subject before our meeting this afternoon. I do this with more pleasure as there are many here present who have not had sufficiently long experience to have attained that familiarity which practice and very extended observation can alone give them, that is necessary to decide the many points that are involved in the compounding of many of the prescriptions which direct the remedies to be dispensed in pillular form. It is hardly necessary to repeat the statements of the treatises on pharmacy, that the excipient should be in complete chemical as well as therapeutic accord with the medicines ordered; but, while it is admitted by all, very many, both of the prescribers and compounders, are either ignorant or negligent of these two laws.

The paper above alluded to, while giving a great many excellent formulas, has given some which are liable to very severe criticism, as a sample which I will submit will prove beyond all question. Another paper, published in the September number of the "Pharmaceutical Journal and Transactions," written by Mr. J. B. Morris, also contains hints and advice which, as it is almost impossible to find any full and systematic treatise upon this subject, it is well for all, especially the younger pharmacentists, to gather up as a part of the knowledge which ere long must decide their claims for skill in this part of their calling.

Some years since, the writer, in an article in the "American Journal

of Pharmacy," 1870, page 195, advocated, among other substances, extract of gentian as a valuable material for assisting the dispenser of pills; and, while it is undoubtedly excellent for very many cases, its use must not be resorted to indiscriminately. All those remedies which are readily reduced by the glucose, which is contained in this extract to the extent of 30 per cent, must be massed with an excipient in which glucose is not present. This will exclude confection of roses, honey, glucose itself, and even cane sugar, as it is changed by moisture and the air.

The remedies which should never be made with the last named substances are calomel, mercurous iodide, permanganate of potassium, oxide and nitrate of silver, cupric oxide, etc. The sample here exhibited of a mass made with mercurous chloride (calomel) and manna, only three weeks since, has undergone such change as to resemble one made from mercury with chalk. This of itself is quite sufficient reason why it should not be used; but when such a mass is treated with distilled water for a time, and the clear liquor decanted, liquor potassa communicates a pinkish tinge and liquor ammonia a whitish cloud, evidencing the presence of mercuric chloride, a result which is necessarily attended with danger. While alluding to this change it may be worth while to state that the well known and very valuable prescription of calomel, sodium bicarbonate and sugar will undergo similar change by exposure to the air, and hence the caution to have such powders frequently made, or only prepared when demanded by the immediate occasion.

It will be found for most of the readily reduced salts that a mixture of glycerin in which 4 per cent. of finely dusted tragacanth has been mixed, and kept for 24 hours before use, is a most admirable excipient; calomel and mercurous iodide pills are thus very well made. For nitrate of silver and permanganate of potassium, fullers' earth, which is principally silicate of alumina, is the most desirable substance, as any organic matter has the immediate effect of decomposing the salts.

The following formulas will enable us to overcome these difficulties: Nitrate of silver gr. viii, fullers' earth gr. xvi, water *q. s.*; ft. mas.; to be divided into xvi pills; reduce the nitrate of silver to powder, add the fullers' earth and rub till intimately mixed, when the water should be added until a good mass is secured. Potassium permanganate gr. xvi, fullers' earth gr. xxiv, water *q. s.*; divide in pills xvi; the permanganate should be powdered in a *perfectly clean*

mortar, the fullers' earth added, thoroughly mixed, and formed into a mass with water.

Another class of substances which are frequently troublesome are the resins and gum resins, and, by many, alcohol in small quantities is recommended, to enable the operator to obtain a plastic, tough mass, which it certainly accomplishes; at the same time the pill as it becomes old gets harder, and almost inert; while the use of Castile soap secures the former quality, and renders the mass soluble in the juices of the stomach. This excipient we have found most successful in making a satisfactory mass with camphor alone, or even with it and powdered capsicum, which is well known to be a most difficult combination to form into a good mass. A small quantity of powdered resin when added to camphor will also enable the dispenser to make pills quite easily and of small size; it must be used quite sparingly, or the pills in a short time will become so soft that they will lose their shape.

Pills in which any essential oil is an important constituent are also well known to be troublesome to the dispenser, who feels that he must conscientiously fulfill the order of the prescriber, and this we have found is most thoroughly attained by the use of powdered Castile soap. A formula which will serve as typical is as follows: \mathcal{R} Aloes pulv. gr. xii, podophyllin gr. iv, oil of hedeoma gtt. xxiv, pulv. sapon. hisp. gr. xii. Rub the oil and soap together till a smooth mixture is attained, then add the aloes and podophyllin, previously well mixed; make into a mass, and divide into 12 pills.

Creasote is also readily made into pills in the same manner. Pill masses containing deliquescent salts can be made by means of Canada balsam, or of soluble cream of tartar. The administration of deliquescent salts in pills is not frequent, and needs less notice than the ferruginous and scaled salts; these are of frequent demand, and several formulas have caused great annoyance to dispensers, Bland's pills being one of them. The use of a portion of dried ferrous sulphate, equivalent to the crystals ordered, has been found to overcome the difficulty, glycerin and tragacanth, as before described, being used as an excipient; the method of procedure being to rub the ferrous sulphate and potassium carbonate separately with a small portion of the glycerin, then mix them thoroughly. Should the mass be too soft, a small amount of tragacanth dust may be added.

The use of manna has been alluded to in the first part of this paper,

and while it is objectionable for some purposes, the writer does not wish to condemn its employment in many instances, as it is very well used in connection with small doses of quinine, morphine and the alkalis; when these, however, are to be used in large sized pills, the quantity required is objectionable, and it may be replaced with advantage by glucose.

The frequent use of phosphorus in pillular form of late years makes it desirable to present a formula which will enable the dispenser to compound almost any of the prescriptions in which it is ordered. This is readily accomplished by keeping a mixture of phosphorus in butter of cacao, in the proportion of 1 grain to 15 of butter of cacao. The best method of preparing this is to put the phosphorus in a test-tube, cover it with a small quantity of the butter of cacao, and melt it and the fat by dipping the tube in hot water, when the remainder of the butter is added and well mixed. Of course in using this the mass is best kept surrounded with a vapor of chloroform, to prevent oxidation. When finished, the pills are to be coated with an ethereal solution of tolu.

In concluding these notes the writer hopes to show the results of some of these formulas, which want of time has prevented him from exhibiting to the meeting.

ADDITIONAL NOTE ON COCAINE HYDROCHLORATE.

BY A. B. LYONS, M.D.

In a recent article on the salts of cocaine, the writer expressed the opinion that cocaine hydrochlorate formed crystals, even from an aqueous solution, which were anhydrous (see page 469). Subsequent experiment has shown that this is not the case. The crystals which form in an aqueous solution contain in fact two molecules, or 9.6 per cent. of water of crystallization. Such crystals are now met with in commerce, commanding a higher price than the smaller anhydrous crystals, which have, of course, greater intrinsic value.

Small crystals, also, are now met with, or a salt having only an indistinctly crystalline character, which contains either water of crystallization or hygroscopic moisture, to the amount of 6 or 8 per cent. of its weight. It is highly desirable that in any official description of the salt the quantity of water of crystallization admissible be distinctly

stated, and manufacturers should place on their labels a statement of the proportion which their product actually contains.

The description given of this salt in the new British Pharmacopœia contains the erroneous statement that it is readily soluble in ether, and otherwise characterizes the salt in a very imperfect manner. The description given of coca leaves, as having a "taste somewhat bitter and aromatic," omits certainly the most important characteristic of the drug—its benumbing effect, lacking which the leaves may be safely pronounced of no value.

ON AN INDIGENOUS SPECIES OF CROTON.¹

BY JOHN M. MAISCH.

A few months ago I was consulted about a plant which had been sent to this city by a farmer in the State of Georgia, with a letter in which the following statements were made concerning the properties of this plant:

"I do not know whether it will cure hay-fever, catarrh, consumption, or not; but I do know that it will cure several diseases. A tea made from this plant will give instant relief in cramp colic, will stop diarrhœa, and, by gargling, will cure sore throat, also any kind of ulcers in the mouth; it will also cure the colic in horses. A man was cured of eating cancer by the use of this plant; but I do not know how he prepared it. When the green plant is cut a drop of bloody water runs out; this blood applied on any kind of bruise, cut or bite will beat anything for healing that I have ever tried or seen tried; it will also stop the flow of blood. The plant appears to be perfectly harmless; I never heard of any one being injured by it."

It was not the extravagant statements made by a non-medical man that attracted my attention, but the fact that the plant proved to be a species of *Croton*, which genus comprises about 450 species, the large majority of which are arborescent or shrubby. The stimulant and tonic barks known as cascarilla, malambo and copalchi are obtained from this genus; the drastic and irritating croton oil is extracted from the seeds of one species, and a kind of dragon's blood is yielded by several Mexican and South American crotons. In addition to the preceding, other woody species of the same genus, indigenous to tropical Asia or tropical America, are more or less employed there, their properties being usually stimulant or acrid, or in some cases irritant.

¹ Read at the Pharmaceutical Meeting, November 17, 1885.

None of the herbaceous species of *Croton* appear to have been medicinally employed. In some older works *Croton chamædrifolius*, *Lamarek*, a perennial herb growing in the West Indian Islands, is mentioned as being used as a vulnerary and in various forms of tumors. But the plant has been transferred to another genus, and is now known as *Acalypha chamædrifolia*, *De Candolle*, while the *Croton chamædrifolius*, *Grisebach*, is an annual plant, and does not seem to have been used in medicine.

Croton tinctorius, *Linné*, an annual plant of the Mediterranean region, has likewise been transferred to another genus; it is now *Crotophora tinctoria*, *A. Jussieu*, or *Tournefortia tinctoria*, *Baillon*. It is cultivated in France, the cultivation being confined to Grand-Gallargues, a village in the neighborhood of Nîmes. The greenish juice in contact with ammoniacal liquids yields a kind of litmus, which turns red by acids, but does not become blue again under the influence of alkalies. Paint rags are made by dipping pieces of muslin into the juice and exposing them to the ammoniacal vapors arising from a mixture of urine and lime, or from horse-dung, until the desired color is produced. This material is stated to be mostly exported to Holland, where it is used for the coloring of cheese and of certain liquors.

Five or six herbaceous species are indigenous to the United States east of the Mississippi, three of which, all annuals, occur northward as far as Illinois and Virginia, while the perennial species *Croton maritimum*, *Walter*, and *Cr. argyranthemum*, *Michaux*, do not appear to extend northward beyond South Carolina. The last named species is the plant, the curative properties of which have been referred to above. The nearly simple root is from 2 to 3 inches long, about $\frac{1}{2}$ inch thick at the neck, crowned with a broader irregular head formed from the stem bases, of a light gray-brown color, and breaks with a short non-fibrous fracture, which is whitish and shows a thickish bark, the inner layer of which is of a red color, and a porous medullium without medullary rays. The stem is about 12 or 18 inches high, branched, rather firm, and the lower portion somewhat woody; the leaves are alternate, about 1 or $1\frac{1}{2}$ inch long, with petioles of $\frac{3}{8}$ to $\frac{5}{8}$ inch in length, firm and thick, oval, oblong or obovate in shape, entire on the margin, rather obtuse at the apex, and narrowed at the base; the midrib is rather prominent on the lower surface; but its branches are quite indistinct. The flowers are of a silvery whiteness and form

short terminal spikes, at the base of which the pistillate flowers are placed: All the aerial parts of the plant are densely covered with scales, imparting a peculiar lustre; these scales have become detached from the older portion of the stem, leaving minute circular scars, which remain visible for some time. Similar scars are also observed on the older leaves, particularly on the upper surface. The scales are formed of small glands, about 0.1 Mm. in diameter, and filled with a red mass; to these glands are attached from 50 to 60 colorless, elongated and stellately arranged cells, which project about 0.1 Mm., or a little more, beyond the gland, and are laterally cohering, except at the apex, which is free, pointed and usually somewhat curved or slightly hooked. The total width of the scales is about 0.3 Mm., or $\frac{1}{40}$ inch. The scales on the branches and on the leaves are alike. The root has a slightly aromatic and a more prominent and rather pleasant bitter taste. The leaves are more aromatic, and are decidedly pungent.

As far as may be judged from the physical properties, this plant probably does not possess any decided or very important medicinal virtues; still, in view of the reputation enjoyed by a number of the woody species of the same genus, it seems to be deserving of investigation. This was suggested more than twenty years ago by Prof. F. P. Porcher, in his "Resources of the Southern Fields and Forests;" the plant specially mentioned by him, *Croton maritimum*, is likewise covered with a silvery scurf, but it is confined to the coast districts, and has broadly oval and subcordate leaves.

MATERIA MEDICA NOTES.

Abstracts from Theses.

Cultivation of Peppermint in Michigan.—From his personal observations in the peppermint plantations, and from information received from mint growers, Dennis Reagan, Ph.G., describes the cultivation to be the same as was stated by M. Fred. Stearns, in 1858 (see "Amer. Jour. Phar.," 1859, p. 35), except that the planting is done annually, the runners of the preceding year being used for the purpose. If the plants are raised from seeds in a nursery, they are reset every two years. Peppermint does not sprout freely after the second year, unless the soil is very rich and loose and the preceding summer has been wet and warm, or the ground is boggy.

The oil obtained per acre varies between three and twenty-six pounds, the average being about sixteen pounds; new mint generally yields a few pounds more than the old, the quality of the oil being the same. The principal weed growing in mint fields is *Erigeron canadense*, *Lin.*; the large growers remove it carefully from the field, and plants which are overlooked are separated from the cut mint, which is smaller. *Erechthites hieracifolia*, *Raf.*, grows only in new clearings. Both these weeds are sometimes distilled separately, and the oils are occasionally used for adulterating oil of peppermint; oil of turpentine is also used for the same purpose. Oil of peppermint, when pure, is said to be rather slowly absorbed if dropped upon blotting paper, while it is at once absorbed if adulterated with any one of the three oils mentioned.

Assays of Cinchona Barks.—Henry Brandner, Jr., Ph.G., obtained by the pharmacopœial process the following amounts of total alkaloids. Bark represented to be

Cinch. succirubra contained	7.78	per cent.	moisture	and	yielded	3.50	per cent.	alkaloids.
" Calisaya, flat,	"	8.02	"	"	"	2.14	"	"
" " quills,	"	7.63	"	"	"	2.572	"	"

The test for quinine, as directed by the Pharmacopœia, gave negative results, and the solutions of the alkaloids yielded no characteristic color with chlorine water and ammonia, nor with chlorine water, potassium ferrocyanide and ammonia. The nature of the alkaloids was not ascertained.

Ailanthus glandulosa, *Desfontaines*.—Fred. Horace Davis, Ph.G., has subjected the bark of this tree to proximate analysis; it is not stated whether the bark of the branches or of the trunk was used for the purpose.

By exsiccation at 100°C., the air dry bark lost 7 per cent. of moisture, and on incineration yielded 5.92 per cent. of ash; of the latter 25.8 per cent. was soluble in water (potassium and sodium chloride and phosphate), and the insoluble portion contained calcium, magnesium and iron as carbonate, sulphate and phosphate. The bark was successively treated with petroleum benzin, ether, alcohol, cold water, boiling water and dilute acid; fixed oil, chlorophyll, resin, wax, sugar, tannin, albumen, gum, starch, pectin, oxalic acid and probably another crystallizable organic acid, soluble in alcohol, were obtained. Distillation with water yielded a trace of volatile oil. Alkaloids and glucosides could not be detected.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

BY THE EDITOR.

(Continued from page 556.)

Genciana. Although *Gentiana calyculata*, *G. mexicana*, *G. Hartwegi* and other species of this genus are indigenous to Mexico, and several of them are abundant, they are not employed medicinally, but the root of *G. lutea* is used. The first named species is known as *Flor de Santo Domingo*, or *Flor de nieve* (snowflower).

Gobernadora de Mexico, *Zygophyllum Fabago*, *Lin.*; *Zygophyllaceæ*; grows in Mexico, but is indigenous to the Orient. The leaves are popularly used in baths and fomentations for relieving rheumatic pains, and the fruit preserved in vinegar like capers, hence the common name *falsa alcaparra*, and in English *bean caper*.

Gobernadora de Puebla, *Eupatorium veronicæfolium*, *Kunth*; *Compositæ*; in the neighborhood of Puebla. The leaves are used like the preceding.

Goma de Sonora is an exudation of *Mimosa laccifera*, produced by the hemipterous insect, *Carteria mexicana*, *Comstock*. It resembles grain-lac, from which it differs in being less deeply red, in having a taste resembling that of succinic acid, and in becoming elastic when heated; it is used against metrorrhagies.

Goma mangle; from *Rhizophora Mangle*, *Lin.*; *Rhizophoraceæ*; in Tampico and other coast districts. It forms rather voluminous masses or separate tears, 5 Cm. or more thick, is reddish-brown externally, dark red internally, hard, breaks with a conchoidal and opaque fracture, and has a sweetish mucilaginous taste and a peculiar odor. It dissolves in water without leaving any residue except the impurities, forming a mucilage of less consistency than that of gum mezquite.

Another variety of *goma mangle*, obtained from *Rhizophora Candel*, *Lin.*, is in distinct slightly adhering tears, externally scaly, glossy, transparent, of little hardness, breaking with an uneven shining fracture, inodorous, of a mucilaginous taste, and dissolves less freely in water, but swells up and forms a thinner mucilage.

The gum is used in the Philippine Islands as a febrifuge, and in Mexico for relieving cough. The fruit is edible. The bark and also the fruit are used for tanning.

Goma de nopal. See page 450.

Gordolobo del país, *Gnaphalium canescens*, *De Cand.*; *Compositæ*; in temperate regions of Mexico. The flowers of this species, as well as of *Gn. Berlandieri*, *De Cand.*; *Gn. hirtum*, *Humb.*, and *Gn. viscosum*, *Humb.*, which are abundant near the capital, are used as a substitute for mullein as an emollient and pectoral.

Guaco, *Aristolochia fragrantissima*, *Ruiz et Pavon*; *Aristolochiaceæ*; in Colima, etc. The branches, which are stimulant and antispasmodic, are woody and twining; the bark is gray, thick and fissured; the cork rolled up; the wood whitish and with large ducts; the odor aromatic, resembling that of French marigold (*Tagetes*), and the taste bitter and aromatic. The drug contains a volatile oil, tannin, resin, bitter principle, gum, starch and salts. It enjoys considerable reputation as an antidote to poisoning by scorpions, vipers and other animals, and is used externally in purulent ophthalmia, blennorrhagia, chronic ulcers, vaginitis, etc. The powder is given in doses of 1 to 5 Gm., and an infusion is made containing 20 Gm. to the liter. *Arist. grandiflora*, *Swartz*, has analogous properties, and in Yucatan the guaco de San Cristóbal, *Ar. pentandra*, *Lin.*, is similarly employed.

In a similar manner are also employed the stems and leaves of different species of *Mikania* (*Compositæ*), namely, *M. Guaco*, *Kunth*, guaco de Tabasco or de Guatemala; *M. Houstonis*, guaco de Veracruz; and *M. Gonvelada*, guaco de Tampico.

Guarana, from the seeds of *Paullinia sorbilis*, *Martius*. The seeds of the Mexican species *P. barbadensis*, *Jacquin*; *P. costata*, *Schlechtendal*, and *P. pinnata*, *Lin.*, may perhaps be made to yield a similar preparation.

Guayabo, *Psidium pomiferum*, *L.*, and *Ps. pyrifera*, *L.*; *Myrtaceæ*; in hot and moist districts. The bark contains tannin 12.1, sugar and other matters soluble in water 13.8, resin and chlorophyll 1.7, calcium oxalate 30.8 per cent., etc. The root and bark are used as astringents in diarrhœa; the leaves as a vulnerary and resolvent, and the fruit as an anthelmintic and aliment.

Habilla de San Ignacio, the seed of *Hura crepitans*, *Lin.*; *Euphorbiaceæ*; in hot and moist districts. The seeds contain 50 per cent. of fixed oil, and are used as a drastic in doses of 0.05 to 0.10 Gm. They should not be confounded with Haba de San Ignacio or Cabalonga, the seeds of *Strychnos Ignatii*.

Hanchinol, *Heimia syphilitica*, *De Cand.*, and *H. salicifolia*, *Link*; *Lythraceæ*; in the State of Mexico. The leaves contain, according to

Alas, fat and chlorophyll 12, extractive and resin 14, bitter principle 9, gum 18, tannin 15, salts 5, tissue 27 per cent.; the resin is stated to be the active portion. The decoction is used as an antisyphilitic, and topically for the cure of ulcers. Alas states that the alcoholic extract is a good hemostatic, and the bitter principle, *nessine*, has febrifuge properties.

Heno, *Tillandsia usneoides*, *Lin.*; Bromeliaceæ; in the Mexican valley, etc. The plant is used as an astringent. This is the so-called *long moss* of our Southern States.

Hipericon. Under this name the flowering tops of several species of *Hypericum* are used for their astringent and balsamic properties, namely *H. perforatum*, *Lin.*, var. *mexicanum* (?), *H. denticulatum*, *H. fastigiatum*, *H. formosum*, *Humboldt et Bonpland*. A composite plant, *Tagetes lucida*, *Car.*, vulgarly known as *periquillo*, is sometimes used in the place of the former.

Hisopo de México, *Salvia axillaris*, *Mociño et Sessé*; Labiatæ; in Guadalajara, etc. Reputed to possess the properties of hyssop. The leaves are linear-oblong, acute, entire, narrowed at the base, and rough-hairy; the axillary verticils contain 2 to 6 flowers. The plant resembles thyme in aspect, and has an aromatic odor and bitter taste. *Verbena ciliata*, the *alfombrilla silvestre*, which is often substituted for the former, is sufficiently distinguished by being inodorous. *Salvia polystachya*, *Ortega*, and *Salvia linearis*, *Mociño*, are also frequently called hyssop.

Hojas de San Pedro, *Daphne salicifolia*, *Kunth*; Thymelaceæ; in the State of Morelos. The leaves are epispastic; the bark might probably be used as a substitute for mezereon.

Huacamote is the starch of *Manihot Api*, *Pohl*.

Huamuchil, *Mimosa Unguis-cati*, *Willdenow*; Leguminosæ; in the hot and moist regions of the eastern slope of the Mexican cordillera. The bark is astringent; the fruit is edible, the juice of the seed produces an abundant secretion of the nose, and the powder is used for cleaning ulcers from maggots and for cicatrizing old ulcers.

Huanita, *Morelosia Huanita*, *La Llave et Lexarza*; Boraginaceæ; in the State of Michoacan. The bark is used as an antiperiodic and astringent.

Huauzontle, *Blitum Bonus-Henricus*, *Reichenbach*; Chenopodiaceæ. The flowering tops are laxative.

Huinar, *Malva scoparia*, *Cavanilles*; *Malvaceæ*; in temperate districts. The root has considerable reputation in the cure of diarrhœas.

Incienso (olibanum), *Ipecacuana blanca* (*Richardsonia scabra*), *Ipecacuana de las minas de Oro* (*Psychotria emetica*), *Ipecacuana oficial*, *Jaborandi* (*Pilocarpus*), *Jalapa oficial*, *Jalapa macho* (*Orizaba root*), *Jalapa de Tampico*, *Jaldre* (yellow orpiment), *Jengibre* (ginger), *Jitomate* (tomato; fruit used as an anodyne), *Kamala*, *Laetucario*, *Lanten* (*Plantago major*, etc.), *Laurel* (*Laurus nobilis*), *Lechnea* (lettuce), *Lenteja*, *Lentejilla* or *Panal* (*Lepidium virginicum*, *Lin.*; in diarrhœa), *Licopodio* (*lycopodium*), *Limon*, *Linaza* (flax seed), *Líquén Carragaheen*, *Líquén de Islandia*, *Lirio de Florencia* (*orris root*), *Lobelia* (*Lob. inflata*), *Lúpulo* (hops) have all been admitted.

Ipecacuana del país, *Solea verticillata*, *Sprengel*; *Violaceæ*; on the hills of Santa Fe, west of the capital, etc. Cervantes Vicente found it (the root?) to be a good substitute for the officinal ipecac, if taken in doses double of those of the latter.

Jalapa de Querétaro, *Ipomœa triflora*, *Velasco*. The root is met with in circular fragments, about 10 Cm. broad and 2 Cm. thick; color gray on the flat, and darker on the convex portions; superficially rough from many gray fibres; odor and taste almost none. M. C. Jimenez ("La Naturaleza," i, 338) obtained from the drug brown extract (aqueous?) 14, resin 16, salts 10·5 per cent., etc. The resin is light yellow, when powdered nearly white, insipid, inodorous, soluble in ammonia with a green-yellow color, partly soluble and partly insoluble in ether. The drug is a drastic purgative; dose of the powder 1 to 2 Gm.; the extract 0·20 to 0·40 Gm.; the resin 0·10 to 0·30 Gm., and the tincture 2 to 4 Gm.

GLEANINGS FROM FOREIGN JOURNALS.

BY GEO. H. OCHSE, PH.G.

Nerolin.—Under the name of *Nerolin*, Messrs. Schimmel & Co. have placed on the market a white crystalline powder, soluble in 30 parts of 95 per cent. alcohol and in 25 parts of the fixed oils, sparingly soluble in water, as a substitute of the expensive oil of neroli. One part of nerolin is equivalent to ten parts of the oil. Several soap manufacturers use nerolin in the proportion of 20 to 30 Gm. to 100 kilos of soap.—*Pharm. Centralhalle*, xxvi, No. 43.

Acetic Ether in Poisoning by Illuminating Gas.—Dr. Leube states that he has used acetic ether where employees in gas-works had

become insensible from the inhalation of illuminating gas. He gives several drops on sugar, the patients soon revive, and in a very short time are again able to work.—*Archiv der Pharm.*, 1885, p. 716.

Metallic Magnesium in Fireworks.—The addition of $2\frac{1}{2}$ per cent. of powdered magnesium entirely conceals the green flame produced by barium salts, giving them a bright white light, similar to the electric light; to the strontium flame it imparts an extraordinary brilliancy. The following formulas yield good results: *White Light.*—Shellac 1 part, nitrate of barium 6 parts; add $2\frac{1}{2}$ per cent. powdered magnesium. *Red Fire.*—Shellac 1 part, nitrate of strontium 5 parts; add $2\frac{1}{2}$ per cent. powdered magnesium. The salts are mixed with the shellac, the mass fused and powdered; then the magnesium is added.—*Arch. d. Pharm.*, 1885, p. 714.

Sublimation of Oxalic Acid.—According to M. Siegfried, oxalic acid sublimes at several degrees below 100°C .

Iodol, a New Antiseptic.—Iodol manufactured by Silber and Ciamicina in Rome has been used in the surgical clinics of Mazzoni. Dr. Mazzoni finds iodol free from the disagreeable odor of iodoform, and does not produce symptoms of intoxication. It is a powerful antiseptic, aiding the formation of healthy granulations and occasionally producing local anæsthesia. Iodol is prepared from volatile animal oil by precipitating the pyrrol with a solution of iodine in iodide of potassium, thus forming pyrrol tetraiodide, or iodol. It is a brown powder, capable of being heated to 100°C . without decomposition; at a higher temperature it is decomposed, giving off iodine vapors and leaving a voluminous coke as residue. Iodol is very slightly soluble in water, and readily soluble in strong alcohol, but precipitated again on adding water. The addition of glycerin to the alcoholic solution does not precipitate it. Ether and chloroform also dissolve it. Tests: Sulphuric acid produces a green color, and by heating the alcoholic solution to which nitric acid has been added a bright red color is produced.—*Rundschau*, xi, p. 668.

Syrup of Hippurate of Calcium.—R: Acid hippuric, pure, 1; milk of lime, q. s.; hot water, 20 cc.: sugar 24; spirit of limon, 0.15. To a portion of the water, heated to 75 or 80°C ., add the acid and milk of lime; agitate, and test from time to time with test paper, until the solution is slightly alkaline; add balance of water and sugar and heat over a gentle fire. The solution of hippurate of calcium is the same without the sugar.—*Répertoire de Pharmacie*, 1885, p. 434.

The benzin odor of old syrup of tolu is attributed to the action of the calcium salts of ordinary water on the balsam of tolu at a higher temperature. M. Labre bases his observation on Mitscherlich's synthesis of benzin, *i. e.*, distilling benzoate of calcium with quick lime, thus forming carbonate of calcium and benzin, $C_{14}H_6O_4 + 2CaO = 2(CaO, CO_2) + C_{12}H_6$. Syrup of tolu made with distilled water does not acquire a benzin odor on standing.—*Répert. de Phar.*, Oct., 1885, p. 438.

Papaverine.—Dr. Guido Goldschmiedt states that the formula of papaverine as given by Hesse ($C_{21}H_{21}NO_4$) is incorrect. He proved by a number of experiments that the formula as originally given by Merck ($C_{20}H_{21}NO_4$) is correct.—*Pharmac. Post*, xviii, p. 1077.

To Detect Gamboge in Mixtures, etc.—Solutions containing gamboge are mixed with powdered glass, evaporated to dryness, powdered, and treated with benzin. If the benzin solution is colorless it is again shaken with the powder and sufficient hydrochloric acid to make the solution decidedly acid. Benzin does not dissolve gamboge in presence of soap. If after treating with benzin and acid the benzin solution is colorless, no gamboge is present. If, however, the solution has a yellow cast, it is filtered and tested as follows: To a small portion of the filtrate is added a dilute solution of caustic soda; if a red coloration is produced, gaseous ammonia is led into the remaining solution until it is saturated. The flakes which separate out are collected on a filter and washed with benzin before dissolving them in alcohol. This solution treated with an alcoholic solution of ferric chloride turns black, and on adding caustic soda the color changes from black to dark yellow, but never red, if gamboge is present. By this method Hirschsohn was able to detect 0.01 gram of gamboge.—*Phar. Zeit. f. Russl.*, xxiv, p. 609.

Impurities in Ether.—Boerrigter confirms the statement of other authors that ether frequently contains hydrogen peroxide and aldehyde. Ether should be kept in dry, tightly corked bottles. The ozone produced by the evaporation of ether, if water is present, converts it into hydrogen peroxide. Pure ether is not discolored by caustic potash, nor is alcohol affected by it unless air has access, when possibly aldehyde is formed.—*Phar. Zeit. f. Russl.*, xxiv, p. 584.

Digitalin, Digitalein and Digitin.—Digitalis is exhausted with water and the infusion is decolorized with animal charcoal, treated with acetate of lead and filtered. The filtrate is then treated with a mixture of 12 parts of liquor plumbi subacetatis and 1 part of spirit of ammo-

nia (liquor Dzondii). The precipitate, consisting of oxide of lead and the glucosides of digitalis, is washed on a filter, then made into a soft paste with water, and sulphuretted hydrogen passed into it. It is again placed on a filter; the filtrate contains all of the digitalein; but digitin and digitalin, being almost insoluble in water, remain on the filter together with the sulphide of lead. Chloroform dissolves the digitalin, and alcohol the digitin. Pure digitalin and digitin are obtained by evaporating the respective solutions. Picrotoxin and solanin are obtained in the same way, but are distinguished as follows:

The picrotoxin precipitate is mucilaginous, acquiring on the addition of concentrated sulphuric acid a saffron-yellow color.

The digitalin precipitate is gelatinous, and acquires a flesh color on the addition of concentrated sulphuric acid.

The solanin precipitate is granular, and on the addition of concentrated sulphuric acid turns dark; if sugar is added it assumes a violet color, gradually turning to blue.—*Phar. Zeit. f. Russl.*, xxiv, p. 561.

New Method of Preparing Cocaine.—Prof. Bignon recommends the liquid hydrocarbons as solvents for cocaine. He proceeds as follows: Coca leaves are macerated about 48 hours in a solution of sodium carbonate (20°), then dried and placed in a percolator with benzin, and again allowed to stand 48 hours. All of the cocaine which has been isolated by the sodium carbonate will be dissolved by the benzin. The benzin solution is shaken with water acidulated with hydrochloric acid (1–10), thus forming cocaine hydrochlorate, which dissolves in the water. The coloring and resinous matter which has been dissolved by the benzin remains with the latter, the acid solution containing pure cocaine hydrochlorate.—*L'Union Pharm.*, xxvi, p. 456.

FOOD FOR INFANTS AND BREAD FOR DIABETICS.

BY DR. H. BEHNKE-REICH.

In “*Zeitschrift d. Allg. Oesterr. Apoth. Ver.*,” 1885, p. 406–408, the author directs attention to a biscuit and a bread, the manufacture of which has been undertaken by H. O. Opel, of Leipzig, under the supervision of a chemist, Dr. Geo. Kerner.

The *nutritive biscuit* is intended for infants after they have reached the age of about four months, but is also quite agreeable to adults, and particularly strengthening to nursing mothers. It is prepared from

the best wheat flour, which is mixed with sugar, malt-yeast, table salt, condensed milk and nutritive salts in such proportions that the finished product has the composition given below. The nutritive salts are prepared by a pharmaceutical chemist, and, according to an assay by B. Kohlmann, made for the pharmaceutical district society of Leipzig, contain in 100 parts 6·66 phosphorus, 65·50 oxygen, 5·17 hydrogen, 3·00 carbon, 10·00 calcium and 9·67 sodium.¹ The dough, properly made, is set aside in a warm place for about an hour and a half, is then placed in suitable moulds, and when sufficiently porous is baked at a dry heat of 200°C. After removal from the oven the cake is exposed to the air for 24 hours, and is afterwards slowly roasted at a temperature of 100°C.

The analysis by B. Kohlmann showed a composition in 100 parts of biscuit of moisture 9·76, aliments of respiration 74·94 (including sugar 5·86), plastic aliments (albumen, etc.) 8·56, fat 2·58, inorganic constituents 4·16 (including calcium phosphate 2·25).

Properly preserved, the biscuit remains good for a long time. It has been used by Dr. Fürst, of Leipzig; Prof. Demme, of Bern, and many other physicians, with good success. The average weight of this nutritive biscuit is not given; but it is stated that two biscuits a day are sufficient for an infant between 3 and 6 months old, and four or five biscuits for a child a year old. The biscuit is softened in good warm cow's milk, which if necessary is suitably diluted with water, or it may be taken with tea, chocolate or beef tea. Dr. Fürst states that babies over 6 months old usually like this biscuit well, digest it properly, and are not subject to glandular swellings, as is often the case if fed on ordinary pastry or farinaceous food.

The *bread for diabetics* is prepared from pure fresh gluten, with the smallest possible quantity of amylaceous additions. Its odor and taste are pleasant, neither insipid nor sickly, and it may be taken by the patients for a long time without becoming repulsive. Kept in an upright position, it remains palatable for more than three weeks. Kohlmann found its composition to be as follows: moisture 22·03, protein compounds 20·56, fat 21·78, carbohydrates 24·28, cellulose

¹ Assuming that organic sodium salts are not used, the analysis corresponds approximately to a mixture of about 50 parts of crystallized sodium carbonate, 10 sodium bicarbonate and 40 calcium phosphate, the latter prepared by precipitating calcium chloride with sodium phosphate; such a mixture contains P 7·2, O 64·4, H 4·8, C 3·5, Ca 9·3 and Na 10·8.—EDITOR.

6.95, mineral constituents (including table salt) 4.40. A similar bread made by P. Ossian, of Paris, contains a larger percentage of carbohydrates (29.71) and of gluten, the latter being partly replaced by fat in the new bread, which thereby becomes more agreeable for continued use, and retains its softness for a longer time.

THE SOLUBILITY OF BINIODIDE OF MERCURY IN FATTY BODIES AND SOME OTHER SOLVENTS.¹

BY C. MÉHU.

Mixtures of fatty bodies with most chemical bodies are wanting in homogeneity, instable and of moderate quality. The water and alcohol usually employed to dissolve the chemical bodies with a view to their more thorough mixture with the fatty bodies volatilize more or less completely; hence the appearance of crystals, sometimes large ones, irregularly distributed through the fatty matter. Further, under the influence of water chemical reactions take place that modify profoundly the original composition of the mixture.

In such preparations I have frequently attempted to substitute solution by simple admixture, without the addition of any solvent, and more than once with entire success.² This note has for its object to call attention more particularly to the solubility of biniodide of mercury in oils, lard, vaselin and other solvents.

Oil of Sweet Almonds.—Oil of sweet almonds dissolves enough biniodide of mercury to satisfy most therapeutic requirements. The following experiments will give a correct indication of this solvent power:

If a mixture of 65 centigrams of amorphous biniodide of mercury and 50 grams of sweet almond oil be triturated in a porcelain capsule placed upon a steam-bath, complete solution will be effected at the end of about a quarter of an hour. This proportion of mercury—13 grams in 1,000 grams of oil—cannot be much exceeded, even with the aid of

¹ Paper read before the Sixth International Pharmaceutical Congress at Brussels. Communicated by the Author.

² In 1868 I pointed out the solubility of benzoate of iron and valerianate of zinc in fatty oils; I also dissolved ferric cinnamate in oils.

a more prolonged trituration. Upon being left to cool, the solution deposits rather rapidly about two-thirds of the biniodide it contained in distinctly formed yellow and red crystals.

Almond oil heated to about 180°C. dissolves about 80 grams of biniodide of mercury in 1,000 grams. Upon this solution cooling it deposits numerous sulphur-yellow crystals of mercury biniodide, the deposit being pretty considerable by the time the temperature has fallen to 150°C. Collected upon a filter these crystals pass rapidly into the red modification.

Almond oil containing, while hot, 8, 7, or 6 grams of the biniodide in 1,000 grams, deposits the greater part of its excess of biniodide before completely cooling.

I have preserved without deposit and for several days, at a temperature of 25°C., almond oil containing 5 grams of biniodide in 1,000 grams; but this oil deposited a notable quantity of biniodide when the temperature fell to about 18°C.

Almond oil containing not more than 4 grams of biniodide of mercury per 1,000 grams has remained fifty days in a cold cellar without depositing the least trace of biniodide. It may, therefore, be considered that this proportion—4 in 1,000—should not be exceeded in practice.

In these experiments, with the object of insuring perfect preservation of the product, I used almond oil that had been previously heated for some minutes to a temperature of 220° to 250°C., and filtered after becoming quite cool. This treatment of the oil is like that I adopted in obtaining the stable phosphorated oil which has now been included in the French Codex. But almond oil of good quality, well filtered and not previously superheated, gives very satisfactory results.

In order to charge almond oil with a larger quantity of mercuric compound recourse may be had to various other compounds. Potassium iodide, for example, increases the solubility of biniodide of mercury in almond oil. Upwards of 50 grams of the combination (HgI_2)₂, KI can be dissolved in 1,000 grams of the oil. For instance, 2 grams of biniodide of mercury and 73 centigrams of iodide of potassium having been dissolved in a steam-bath in 50 grams of almond oil, the solution after remaining six weeks in a cellar had only deposited some minute crystals of biniodide, due probably to the insufficient purity of the commercial iodide of potassium. I have raised the quantity of iodo-hydrargyrate of potassium beyond 75 grams per kilogram of oil,

without any sensible deposit taking place during cooling; or even after eight days.

Olive Oil.—At 100°C. olive oil behaves nearly like almond oil towards biniodide of mercury. It deposits slowly the excess of biniodide, and does not appear to retain more of it when cold.

Poppy Seed Oil.—At about 100°C. poppy seed oil dissolves notably more biniodide of mercury than almond oil. At that temperature I have dissolved 15.35 grams of biniodide of mercury in 1,000 grams of the oil. When cold, poppy seed oil retains in solution three times as much of the biniodide as almond oil. A solution of 10 grams of biniodide of mercury in 1,000 grams of poppy seed oil did not become turbid even after remaining ten days in the cellar. This experiment was made twice.

Nut Oil.—At about 100°C. nut oil dissolves 15 grams of biniodide of mercury in 1,000 grams. In the cold, nut oil retains in solution about 13 grams of the biniodide per kilogram.

Poppy seed oil and nut oil are both drying oils; they are distinguished from almond oil and olive oil by possessing a solvent power a little greater when hot, and nearly three times as great when cold.

Castor Oil.—Castor oil is one of the most powerful solvents of biniodide of mercury. By heating in a porcelain capsule, in a steam-bath, to about 100°C., and using a small glass pestle as a stirrer, it is possible to dissolve 1 gram of biniodide of mercury in 25 grams of castor oil, or 40 grams in 1,000 grams of oil. Upon being left to cool, the oil deposits only half the dissolved biniodide.

A solution of 1 gram of biniodide of mercury in 40 grams of castor oil still deposits slowly red crystals of the biniodide.

A solution of 1 gram of biniodide of mercury in 50 grams of castor oil does not become turbid in cooling, and even after standing a month at the ordinary temperature it remains absolutely clear. This solution contains, therefore, one-fiftieth of its weight of biniodide of mercury. It appears to me capable of satisfying all therapeutic requirements.

The combination of the biniodide with the bichloride of mercury dissolves readily in the oil. At the temperature of the vapor-bath it is easy to dissolve 80 grams of biniodide of mercury and 48 grams of bichloride of mercury in 1,000 grams of castor oil. Only a small proportion of the mixture separates during the cooling; the deposit contains a whitish crystalline combination of the two constituents. The castor oil retains, when cold, nearly 10 per cent. of a mixture of

equal equivalents of biniodide (eq.=227) and bichloride (eq.=135.5) of mercury, only traces separating in course of time of the slightly yellowish white crystalline compound already mentioned.

Iodide of potassium increases considerably the solubility of biniodide of mercury in castor oil. In a steam-bath, at a temperature near 100°C., I have dissolved easily 200 grams of the compound $(\text{HgI})_2\text{KI}$ in 1,000 grams of castor oil. Iodohydrargyrate of potassium, which contains 73.1 per cent. of its weight of biniodide of mercury, dissolves, therefore, in five times its weight of castor oil at a temperature near 100°. The solution kept for three weeks at a temperature of 20°C. gave only traces of a yellow crystalline compound. The solubility of the iodohydrargyrate is, therefore, the same in hot and in cold castor oil.

Lard.—If lard be melted in a steam-bath in a porcelain dish, and 1.25 gram of biniodide of mercury be added per 100 grams of lard, the mixture being stirred with a glass pestle, all the biniodide can be dissolved. The solution is clear and colorless; but, upon being left to cool, it becomes rose-colored in solidifying and deposits biniodide of mercury, which can be seen to be distinctly crystalline under the microscope.

When this solution—12.5 grams of biniodide in 1,000 grams of lard—is diluted with its own weight of lard it still becomes rose-colored in solidifying, and deposits crystals of biniodide of mercury. But lard which contains not more than 4.5 grams of biniodide of mercury in 1,000 grams no longer deposits crystals of the biniodide in cooling.

Vaselin.—Vaselin dissolves little biniodide of mercury, even with the aid of heat. In a steam-bath, and using a small glass pestle to rub down the mercuric compound, the quantity dissolved is not sensibly in excess of 2 grams of biniodide in 1,000 grams of vaselin. The solution is limpid and colorless. Left to cool it becomes strongly rose-colored; it even deposits the biniodide upon the sides of the capsule before solidifying. Upon augmenting gradually the quantity of vaselin the solution of 1 part in 1,060 assumes a clear salmon tint in cooling, and deposits numerous crystals of biniodide. A solution of 1 in 1,500 when cool has a very marked orange-rose tint, and deposits very distinct crystals of biniodide. From a solution of 1 in 2,500 there still separate during the cooling perfectly distinct crystals in quantity sufficient to impart to the cold mixture a slight rose color.

Upon lowering the proportion of biniodide to 1 in 4,000, the cool liquid no longer deposits the least trace of biniodide.

Carbolic Acid.—Heated to about 100°C. carbolic acid dissolves a little more than 20 grams of biniodide of mercury in 1,000 grams. Left to cool the solution deposits more than half the biniodide it contained; the exact determination of the quantity is hardly practicable in consequence of the solid condition of the cold mixture.

Benzin.—One thousand grams of rectified commercial benzin dissolves 20 grams of biniodide of mercury at a temperature near 100°C. At the ordinary temperature benzin retains in solution only 4 grams of the biniodide in 1,000 grams.

Various Mercuric Compounds.—In England and the United States the oleate of mercury in solution in oils is frequently employed. It is obtained by triturating—preferably in the cold during twenty-four hours, or heating to a temperature exceeding 70°C.—a mixture of 10 parts of yellow oxide of mercury and 90 parts of purified oleic acid. Such a preparation keeps badly in proportion as it is weaker in mercury; it deposits metallic mercury as the oleic acid becomes transformed into oxyoleic acid. An oleate with 20 per cent. of oxide of mercury has also been recommended as keeping better, it being diluted with oleic acid or olive oil as required. The observations of Squibb,¹ Parsons² and Tichborne³ have, however, demonstrated the great instability of these mixtures, which are in no way comparable to definite and stable officinal preparations, such as the solutions of biniodide of mercury in oils that I have here described.—*Phar. Jour. and Trans.*, Oct. 17, 1885, p. 327.

COCA LEAF CIGARS AND CIGARETTES.—Dr. Lewis Lewis, Philadelphia, has been using cigarettes composed in part of coca leaf and partly of tobacco, for about nine years, in the treatment of throat affections. Dr. F. E. Stewart ("Phil. Med. Times," Sept. 19, 1885,) has employed a cigar made of coca leaf with a wrapper of mild imported tobacco; also a cigarette of coca wrapped with rice paper, and a "smoking tobacco" made of coca without admixture of any kind, which may be smoked in a pipe. By the use of these preparations the peculiar effects of coca were obtained, though in a milder degree than after taking it internally.

¹ "Pharmaceutical Journal" [3], xiii, 530.

² *Ibid.* [3], xv, 656.

³ *Ibid.* [3], xv., 576

CONTRIBUTION TO THE CHEMISTRY OF RHUBARB
ROOT.¹

BY M. KUBLI.

Any one who may have occupied himself with the chemical investigation of the three vegetable drugs, rhubarb, senna leaves, and *Rhamnus Frangula* bark, will have made the observation that there is present in them a peculiar body containing nitrogen and sulphur, which especially accompanies the active constituents of these drugs with great persistency. In resuming some interrupted studies of rhubarb root in the laboratory of the hospital pharmacy at Dünaburg, the author sought first to ascertain what part this peculiar body played in these vegetable substances, and whether it might not be considered as belonging to the non-organized ferments, such as emulsin, myrosin, etc. The present paper is a preliminary contribution to the solution of this question.

After Schlossberger and Döpping had first recognized the presence of chrysophanic acid in rhubarb² the author demonstrated that the acid occurred in the form of a glucoside³ that split upon being boiled with acids into chrysophanic acid and sugar, to which he gave the name "chrysophan." Dragendorff, subsequently, in analyzing five different commercial varieties of rhubarb,⁴ confirmed the observation of the author that chrysophanic acid occurs ready formed only in very small quantities in the root. According to this analysis it was present in appreciable quantity (1.01 per cent.) only in *Rheum sibiricum*, whilst in the other four commercial varieties (*Rheum Moscoviticum*, *R. Chinense*, *R. palmatum tanguticum*, and *R. Anglicum cultum*) either none or only traces could be detected. The method used by Dragendorff for the estimation of the chrysophanic acid consisted in extracting powdered rhubarb with light petroleum spirit, the petroleum being colored intensely yellow when the rhubarb under examination contained free chrysophanic acid, whilst in the opposite case it remained colorless.

The correctness of this method of testing may be verified by boiling powdered rhubarb in which no chrysophanic acid can be detected by

¹ "Pharmaceutische Zeitschrift für Russland," xxiv, 193.

² "Liebig's Annalen," 1844, i, 215.

³ "Pharm. Zeit. f. Russland," vi, 603.

⁴ "Pharmaceutical Journal," [3], viii, 826.

means of petroleum spirit twice with 94 per cent. alcohol, and allowing the hot filtered liquor to evaporate spontaneously, when no chrysophanic acid, either in the crystalline or the amorphous condition will be found to separate. But if this experiment be varied, so that rhubarb powder, in which chrysophanic acid cannot be detected by the above method, be first macerated with water forty-eight hours, the residue filtered off and dried, and then shaken with petroleum spirit, the interesting observation will be made that the petroleum spirit immediately becomes intensely yellow. Further, if a rhubarb powder thus previously treated with water be boiled with alcohol, and the hot filtered extract allowed to evaporate spontaneously in a porcelain dish, a not inconsiderable quantity of chrysophanic acid will separate out, partially amorphous and part in a granular crystalline condition.

In illustration of this statement the following experiments may be quoted. They were made with two sorts of Chinese rhubarb which were supplied in 1878 and 1879 from the Crown warehouse in Warsaw to the hospitals of the Wilna military district (I and II), and with a crown rhubarb in powder, for which the author was indebted to Professor Trapp.

1. Estimation of moisture made between 100° and 105°C .

1.006 gram of No. I lost 0.073 gram = 7.26 per cent.

1.013 gram of No. II lost 0.077 gram = 7.70 per cent.

0.982 gram of No. III lost 0.079 gram = 8.04 per cent.

2. A gram of each kind was digested eight days with twelve grams of light petroleum spirit at the ordinary temperature, with agitation. In all these cases the supernatant liquid remained perfectly colorless, and upon evaporation not a trace of chrysophanic acid, but only a small quantity of a soft fatty mass, was left.

3. Each gram of rhubarb was placed with sixteen grams of 96° alcohol in a small retort provided with a return condenser, and maintained at the boiling temperature three minutes. The liquid was then filtered off, and the residual rhubarb heated to boiling with eight grams of fresh alcohol, the liquid again filtered off, and the united extracts left to evaporate spontaneously in a porcelain dish. In neither case was there a separation of a trace of chrysophanic acid.

4. One gram of No. I was macerated forty-eight hours with 20 cc. of distilled water, with agitation; after filtration the residue was worked upon the filter with 13 cc. of water, dried at about 30°C ., and rubbed down in an agate mortar.

The powder thus obtained was then treated exactly as that in experiment 3; that is, boiled with alcohol and the extract allowed to evaporate at the ordinary temperature. Already, on the second day, a yellow granular precipitate had separated, partly upon the bottom and sides of the dish and partly as a yellow crystalline skin upon the surface of the liquid. On the third day, after the complete evaporation of the liquid, the yellowish residue in the dish was taken up with 10 grams of 40° spirit, filtered, the residue washed upon the filter with 6 grams of spirit of the same strength, but boiling, in order to remove impurities, such as phæoretin, erythretein and fat, and then the remainder, together with the filter, dried at between 100° and 105°C. The weight of the colored matter amounted to 0.0196 gram, which calculated upon the dried substance represented 2.12 per cent. It was of a golden yellow color, presented a granular crystallization, and separated readily from the filter after drying. It behaved towards reagents and solvents exactly like chrysophanic acid. Nevertheless, it still contained traces of emodin, which could be demonstrated in the following way. The colored matter was treated, as recommended by Rochleder, with boiling soda solution, in which chrysophanic acid is insoluble, the solution decomposed with hydrochloric acid, and the separated flocks collected upon a filter, washed, taken up in a little hot 94° alcohol and the solution left to evaporate to about one-third of its volume on a watch-glass. Yellow flocks were then found to have separated, which brought under the microscope by means of a glass rod proved to consist of agglomerations of needles grouped in a stellate arrangement round a generally darker cellular-formed nucleus.

1.0236 gram of rhubarb No. II, treated in exactly the same way as in the previous experiment, No. 4, gave 0.098 gram of chrysophanic acid = 2.09 per cent. of coloring matter in the dried substance.

1.0174 gram of rhubarb No. III gave 0.0194 gram of chrysophanic acid = 2.07 per cent. in the dried substance. In the coloring matters prepared from Nos. II and III also distinct traces of emodin could be detected.

5. 1.0236 of rhubarb No. II, treated exactly as in experiment 4, only with the difference that instead of forty-eight hours it was macerated with water twenty-four hours, gave 0.021 gram of coloring matter = 2.21 per cent. in the dried substance.

It will be seen that this yield was somewhat larger than that from

the same kind of rhubarb root after forty-eight hours' maceration in water (experiment 4). But whilst the colored matter obtained in experiment 4 was, after drying, of a golden yellow color, showed a granular crystalline condition and separated readily from the filter, that obtained in this subsequent experiment had, after drying, a more dirty yellow color, adhered closely to the filter and the horny crystalline form was less pronounced.

In this case a small quantity of amorphous substance still clung to the coloring matter, due probably to the shorter duration of the maceration of the rhubarb powder with water.

6. 1.037 gram of rhubarb No. III was treated with water as in experiment 4, and then upon the dried residual rhubarb was poured 12 grams of light petroleum spirit, which upon being shaken was immediately colored intensely yellow. After eight days' maceration the liquid was filtered off, more petroleum spirit passed through the rhubarb on the filter and the filtrate evaporated. The residue, dried at between 100° and 105°C. , amounted to 0.013 gram = 1.36 per cent. of dried substance; it consisted of chrysophanic acid and fat.

It will be seen that here the yield was considerably smaller than by the process followed in experiment 4, and this is explained by the fact that chrysophanic acid is only soluble to a small extent in light petroleum spirit, so that an eight days' maceration of the root with twelve times its weight of light petroleum spirit only partially exhausted it. When the residual rhubarb from this experiment was treated with a second quantity of petroleum spirit, the latter after a time acquired a strong yellow color. Light petroleum spirit would seem, therefore, to be better adapted for the qualitative than for the quantitative determination of chrysophanic acid in rhubarb.

The foregoing experiments make us acquainted with the interesting fact that chrysophanic acid is first formed in rhubarb root upon digestion of the latter with water; and that therefore little or none of this acid exists preformed in the more important kinds of rhubarb. The formation of chrysophanic acid is due without doubt to its splitting off from the mother substance, chrysophan, effected probably by a ferment-like body, which is soluble in water, but not soluble in alcohol; it is for this reason that an alcoholic extract of the root can be evaporated without decomposition, because while chrysophan will be contained in it the body causing the fermentation will not. In this way also it is explained sufficiently for present purposes how an

extract of rhubarb prepared with dilute spirit—for instance, tincture of rhubarb—will deposit from time to time a precipitate, which according to Clarke consists chiefly of chrysophanic acid. In such an extract there is, besides the chrysophan of the root, a part also of the body capable of acting upon it as a ferment. The breaking up of the glucoside is therefore only imperfectly and gradually effected.

In a watery extract of rhubarb—and consequently in all the official extracts prepared by macerating the root with water—it would appear from the foregoing experiments that only a little chrysophan can be expected, because under such conditions the glucoside undergoes decomposition. This agrees with the experience of the author in a previous investigation, when he obtained not more than 0·6 or 0·7 gram of chrysophan from 420 grams of “crown” or good Chinese rhubarb. On the other hand, all the separated chrysophanic acid will be found after the maceration in the residual marc; the residue after the preparation of *extractum rhei* could therefore be profitably used as a source of pure chrysophanic acid, as the article appearing in commerce is not generally pure. For this purpose the dried and powdered marc should be heated to boiling with three times its weight of alcohol of at least 90° Tr., in a retort provided with a return condenser, the temperature maintained five minutes, the liquor filtered, the residue boiled a second time with one-and-a-half times its weight of alcohol, again filtered, and the united filtrates allowed to stand twenty-four hours in the cold in a stoppered vessel. A large portion of the chrysophanic acid will separate in a granular crystalline condition. If the supernatant liquid be decanted, the alcohol distilled off and the residue treated with dilute alcohol (40° to 50° Tr.), in which chrysophanic acid is insoluble, a further quantity of coloring matter may be obtained.

According to recent observations, chrysophanic acid possesses strongly antiseptic properties, to which rhubarb doubtless owes its beneficial action in catarrh of the stomach, indigestion, etc. These properties belong to chrysophan also, but to a more intense degree; because it may be expected that when it reaches the stomach chrysophanic acid is at once split off and is thus brought into action in a nascent condition. It would seem therefore desirable that in the official preparations this substance pertaining to the active constituents of rhubarb root should be present in its integrity. As has been shown, in many preparations of rhubarb little or no chrysophan is to

be expected, because the existing formulæ do not take into account the chemical properties of this compound. In a future communication, which will deal, among other things, with the purgative principle of rhubarb, the author proposes to submit some formulæ for such preparations.—*Phar. Jour. and Trans.*, July 18, 1885, p. 65.

REPORT ON PRESSED ERGOT.¹

BY JOHN MOSS, F.I.C., F.C.S.

On Wednesday, August 14, 1878, a "Note on an Improved Preparation of Ergot" was read by Mr. A. W. Postans, F.C.S., at a meeting of the British Pharmaceutical Conference, held in Dublin. (See "*Amer. Jour. Phar.*," 1878, p. 581.) In the discussion which followed, Mr. T. B. Groves, of Weymouth, a pharmacist of wide experience and fertile in expedient, suggested that ergot itself might keep better if it were first ground and then compressed. The suggestion struck me as being a very valuable one, for strong hydraulic pressure would remove a considerable portion of the fixed oil, which I believe has an attraction for the insects which prey upon ergot, and the solid compressed form would offer so much less extent of surface than the ordinary drug that it might reasonably be expected to be less affected by atmospheric influences. The experiment was accordingly tried in February, 1879, on 7 lbs. of ordinary commercial ergot, which was ground and then subjected in three separate lots to a pressure of 2½ tons to the square inch. Fourteen ounces of fixed oil (12·5 per cent,) were obtained, and three cakes, each about 8 inches square. Mr. Groves took charge of half of one of these cakes, and Mr. Holmes placed the other half in the Museum at Bloomsbury Square. Mr. Groves placed his specimen in a storeroom, where, as he informs me in a letter dated July 17, 1885, it lay on a shelf "without any special care being given to it. To-day it looks as good as ever; I send you a bit to see. But the question is, how about its potency; does it retain its medicinal activity?" This was the crucial question, and to decide it I obtained from Mr. Groves more of the cake and made a fluid extract, proceeding as the British Pharmacopœia directs, except that the ether treatment was omitted. There is a specimen of the cake on the table. In color it strongly resembles linseed cake, but the grain is

¹ Read before the British Pharmaceutical Conference.

much finer. It has the characteristic smell of ergot, and certainly seems no worse for age. Another specimen of the cake, kindly sent me by Mr. Holmes from the Museum, had when received a stronger smell and appeared to be not quite so dry. It had been kept in a bottle and evidently sweated there. Neither specimen showed signs of insect life, but of the two modes of keeping, to let it lie in paper seems the best. The cake readily breaks down with hot water and absorbs three or four times its own weight. It is convenient also for disintegration by a grater, should it be desired to administer the powder.

Oil in Pressed Ergot.—It may be convenient to mention here that in order to reply to questions which were put when the pressed cake was first exhibited at Bloomsbury Square in 1879, the oil was extracted by ether from 100 grains of it reduced to powder, and when dried was found to weigh 13.7 grains; this with the 12.5 grains removed by pressure makes 26.2 per cent, and what was absorbed by the pressing cloths will make up the oil to the normal quantity present in ergot, about 30 per cent. By operating with special appliances, such as are used by oil pressers, more oil could be removed from the cake than my experiments show, and, working on a larger scale, the proportion absorbed by the cloths would be smaller.

Liquid Extract.—In order that the liquid extract from pressed ergot might compare on all fours with the ordinary preparation, the increased richness of the cake, as compared with ergot, from removal of inert oil by pressure and loss of moisture by long exposure in a dry warehouse, must be taken into account. No actual observation of the original weight of the cake would appear to have been made, but an estimated loss of 6 per cent. for moisture, *plus* 16 per cent. of oil ascertained, will not unduly favor the cake. Working on this basis, half a pound of pressed ergot was used to make $10\frac{1}{4}$ fluidounces of liquid extract. A specimen of this is on the table, and on examination it will be perceived that it has the characteristic odor and taste of ergot in a greatly modified degree. It is also paler and has not the body of the extract as ordinarily prepared. This is no doubt due in part to extractive being carried away in the oil during pressing, and possibly also partly due to long exposure having rendered some extractive insoluble. Be that as it may, it may in a measure account for the preference which patients give it over ordinary extract as intimated below.

Potency.—The liquid extract was placed in the hands of my friend,

Mr. M. G. Biggs, M.R.C.S., of Wandsworth, the nature of whose practice affords him abundant opportunity for watching the effects of ergot. I append the result of his trials in his own words:

"Report on Action of Liquid Extract of Ergot.

"The liquid extract of ergot supplied by Mr. Moss was used in three cases of confinement. All had had children previously; in the first case, after the birth of the child and detachment of the placenta there was a tendency to flooding owing to inertia of the uterus; in about fifteen or twenty minutes pains came on, the uterus contracted, and hæmorrhage ceased, the contraction remaining permanent; there were no after pains, although after each previous delivery these had been very bad. This I have sometimes found before as a result of administering ergot, and therefore regard it as an extra proof of perfect action. The other two cases were simply suffering from inertia, pains were weak and threatened cessation; in each case the liquid extract was used, and with apparently the usual results. Neither of these cases was, however, to be relied on fully, as pains might have come on naturally. The last case in which I used it, however, was an almost perfect physiological experiment.

"It was a case of miscarriage at the third month. When I arrived the patient had lost a large amount of blood, and was having labor pains rather severely; the ovum, however, was projecting slightly from a partially dilated os, the vagina was plugged, and the hæmorrhage and pain ceased. The next evening on removing the plug things were *in statu quo*. I gave a dose of the liquid extract (one drachm) and plugged again. Shortly after pains again came on, but did not last long. The next day two other doses were given of the same strength, and each time pains came on and lasted some time, and on removing the second plug the os, which had before been partly opened, was now firmly closed. The case is still proceeding, but there could be no clearer proof of the action of the liquid extract than the cessation of pains altogether, unless shortly after a dose of ergot, and the recurrence of these phenomena after each separate dose.

"Mr. Webb, my assistant, has also used the liquid extract, and he is convinced that it is perfectly active, and says the patients prefer it to other kinds; in his estimation it is an elegant preparation."

From these observations it appears conclusive that pressed ergot retains full potency after six and a half years, and that no special care is necessary to preserve it from insect attacks or from climatic influences which are adverse to the ordinary drug.

I beg to express my thanks to Mr. Biggs for the prompt and effective assistance which has given point to this short report.—*Phar. Jour. Trans.*, Sept. 26, 1885, p. 274.

QUININE LACTATE, dissolved in four parts of water, is recommended by Vigier for hypodermic use. The salt is rich in alkaloid, has a neutral reaction, and its injection does not produce pain or inflammation.—*Gaz. Hebdom.*

ON THE EXTRACTION OF THE ALKALOIDS FROM
CINCHONA BARK BY DILUTE ACIDS.

BY DR. J. E. DE VRIJ, C.I.E.

*Reprint from the "Chemist and Druggist," August 15, 1885, communicated
by the Author.*

Many years' experience has taught me that *all* the alkaloids contained in cinchona bark can be completely extracted by treating the bark in fine powder with hydrochloric, nitric, or phosphoric acid, but that extraction cannot be completely effected by sulphuric acid. This has been disputed by some chemists, and by no one more strongly than by Dr. B. Paul, who stated at the evening meeting of the Pharmaceutical Society, held on December 3, 1884, as the result of recent investigations on various succirubra barks, that they retained nearly 50 per cent. of their alkaloids after extraction by hydrochloric acid.¹ But since, as I showed some years ago,² 40 per cent. of the alkaloids present in cinchona bark may be extracted by cold water alone, Dr. Paul's statement will appear on the face of it extremely improbable. I have, nevertheless, been induced to make a new and accurate investigation of this matter, thus late in my career, by the fact that other chemists have also obtained unsatisfactory results in attempting to extract the alkaloids of cinchona bark by dilute hydrochloric acid.

When I published, some years ago,³ my process for the preparation of ext. cinchonæ liq., in which two molecules of HCl are used for each molecule of total alkaloids, I pointed out that a material quantity of alkaloid, amounting to about 20 per cent. of the whole was left behind in the bark. It follows, therefore, that if—as I hope to show—the extraction of the whole of the alkaloids by dilute HCl is possible, more than two molecules of the acid must be used. The explanation of this is that the alkaloids do not exist in the bark in the *free* state, but in combination with quinic, quinovic, and more largely with cinchotannic acid. When also it is remembered that the amount of the latter (cinchotannic acid) is often very considerable, reaching, as I have recently observed in a bark of cinchona officinalis, to more than 12 per cent., as against 6.72 per cent. of alkaloids, and when we

¹ "Pharmaceutical Journal," December 6, 1884.² "Haaxman's Tydschrift der Pharmacie," 1879, p. 258.³ "Haaxman's Tydschrift der Pharmacie," 1880, p. 5.

consider the influence of *quantity* in chemical reactions (l'influence des masses), as propounded by Berthollet in his "Statique Chimique," the necessity for a preponderating quantity of acid will require no further demonstration.

A series of observations on bark of *C. officinalis* and *succirubra* showed that four molecules of HCl (4×36.5) sufficed for one molecule of total alkaloids, of which the molecular weight may be taken to be 310. Supposing, therefore, that the total alkaloids of the bark to be operated upon do not exceed 10 per cent., 17 grammes of strong HCl, containing 30 per cent. of real HCl, will be sufficient for the complete extraction of 100 grammes of finely-powdered bark. More acid must be used in those rare cases in which the alkaloids exceed 10 per cent.

The method of applying the quantity of acid thus determined is also important to the success of the operation. The acid should be mixed with a portion of water equal to the quantity of bark, and the bark should then be added so as to form a thick paste, which is to be left for some hours. More water is then stirred in until the whole is sufficiently fluid to pour freely. Much foam is formed at this stage, and it is necessary to postpone the next operation until the foam has entirely disappeared. Percolation is then effected in a cylindrical glass tube with constricted exit, which is closed by a loose plug of "charpie."¹ As soon as the percolate begins to run clear it is collected, percolation being kept up by pouring on distilled water until excess of caustic soda ceases to produce a precipitate in the passing percolate.

I must now allude to two matters, one of which has been publicly advanced as an objection to the above process, whilst the other has been communicated to me privately.

1. It has been objected that after the percolate, as above, has ceased to be acted upon by caustic soda, the addition of the well-known reagent iodide of mercury and potassium shows a distinct alkaloidal reaction, and percolation must be carried much farther before this reaction ceases. Although not myself attaching importance to this objection, I have thought it right to ascertain by actual experiment

¹"Charpie" is the French name for threads of old linen. Upon this apparently insignificant agent the success of the operation largely depends, whether it shall be completed in a few hours, or whether it may be prolonged for days.

how far it affects the accuracy of the process. Twenty grammes of succirubra bark were therefore treated in the manner described, until 180 cc. of percolate had been recovered, when caustic soda ceased to produce precipitation. The percolation was then resumed until further 950 cc. had been recovered, and the reaction with HgI , KaI had also ceased. To this second portion (950 cc.) a sufficient quantity of the mercuric reagent was added, and the liquor was allowed to settle for some days, when the clear supernatant was decanted, and the precipitate was carefully collected on a filter. It was found that while the first portion of the percolate, 180 cc., yielded 1.42 gramme of alkaloids, the second portion yielded only 0.031 gramme of the compound of alkaloids with iodide of mercury, corresponding to less than 0.015 gramme alkaloids. This inaccuracy, amounting to no more than 1 per cent. of the alkaloids present in the bark, is so small that it may, I think, be disregarded.

2. It has been remarked that the percolate, after running clear for a considerable quantity, presently becomes turbid. I have also sometimes met with this inconvenience, which I attributed some years ago to the behavior of cinchotannic acid under certain conditions. In analyzing 20 grammes of a sample of *C. officinalis*, which proved to be very rich in cinchotannic acid, I observed that after 97 cc. of perfectly clear percolate had been recovered, the succeeding drops caused a slight turbidity in the previously clear liquor. The percolate was therefore separated at this point into two portions. While remaining apart both were perfectly clear, but when mixed together a very turbid mixture resulted. The explanation is simple. Cinchotannic acid is freely soluble in water, but scarcely soluble at all in acids. The earlier percolate, containing much hydrochloric acid, dissolved but little cinchotannic acid; the later percolate, being almost free from acid, dissolved much cinchotannic acid, which was again thrown out of solution when brought into contact with the previously collected acid percolate.¹

Although the whole of the alkaloids may be extracted from cinchona bark either by hydrochloric, phosphoric, or nitric acids, used

¹The above observations may be further verified thus: Let 1 part *Indian* cinchona bark of any species be percolated with 4 parts water. To the clear percolate add excess of HCl , and an abundant precipitate of cinchotannic acid will be produced. *American* calisaya bark, on the contrary, shows no such reaction, in consequence of its small amount of cinchotannic acid.

in proportions equivalent to those quoted above, a slight difference will be observed in the results obtained when nitric acid is employed, the amount of alkaloid being less by a few centigrammes than that obtained by hydrochloric acid. The latter acid dissolves a colored substance contained in cinchona bark, which is not alkaloid, but which behaves towards hydrochloric acid as if it were so. This substance is not soluble in nitric acid. If, therefore, the total alkaloids extracted by hydrochloric acid are afterwards treated with dilute nitric acid, the whole of the *alkaloids* will be redissolved, leaving a very small quantity of brownish matter unacted upon. I believe the behaviour of this brown residue to be one of the causes of discrepancy in analyses of bark performed by different methods.

To show that cinchona bark cannot be completely exhausted of its alkaloids by dilute sulphuric acid, 20 grammes of powdered bark (ascertained to contain 6.72 per cent. of total alkaloids by the hydrochloric-acid process above described) were treated with an equivalent quantity of sulphuric acid employed in the same manner. The first percolate (100 cc.) was of a much paler color than that obtained by hydrochloric acid; it was rendered only slightly turbid by caustic soda, or by HgI , KaI , and was only slightly reddened by the former. The percolation was continued until 677 cc. had been recovered. This large volume (more than thirty-three times the weight of the bark) yielded only 0.807 gramme, or 4.035 per cent. of alkaloid. Percolation was therefore resumed until a further 800 cc. were recovered, which yielded 0.063 gramme alkaloids. The total results from 1,477 cc. percolate (more than 70 volumes) was therefore only $0.807 + 0.063 = 0.87$ gramme, or 4.35 per cent., from a bark known to contain 6.72 per cent. From this it must be concluded that sulphuric acid is practically incapable of extracting the whole of the alkaloids of cinchona bark.

Before proceeding to speak of the practical application of the above process, I may explain why I have always insisted upon the use of *cold* dilute acids in operating upon cinchona bark.

If bark powder, which has been completely exhausted of its alkaloids by cold hydrochloric acid, be heated to ebullition with more dilute HCl , and the liquid after being strained be accurately saturated by caustic soda, a voluminous red precipitate is formed resembling the so-called pectic substances described by Fremy, but containing not a trace of alkaloid. The intrusion of this matter makes the extraction

of the alkaloids at a high temperature much more difficult, and is unattended with any advantages.

I have been thus minute in discussing the treatment of cinchona bark by dilute acids for two reasons, viz:

1. Because the extraction of the alkaloids from bark by hydrochloric acid has been extensively practiced in Bengal since 1872 in the manufacture of the well-known cinchona febrifuge (sometimes called "Indian quinine"), and the process, which was adopted on my recommendation to the Secretary of State for India, has been condemned as *wasteful* by the editor of the "Pharmaceutical Journal."¹

2. Because, as an old pharmacist, I wish all pharmacists to examine for themselves the quality of the cinchona bark that they use, and I consider the hydrochloric-acid process by far the most suitable for pharmaceutical uses. It is simple, inexpensive, thoroughly reliable, and practically (if not scientifically) accurate. It is also capable of indicating not only the percentage of alkaloids, but also the proportion of cinchotannic acid, which is of no small importance from a therapeutic point of view.

The following directions will enable pharmacists to obtain satisfactory results with facility:

Mode of Analyzing Cinchona Bark by Hydrochloric Acid.

Twenty grammes of finely-powdered bark are treated with hydrochloric acid and water as above described, whereby *all* the alkaloids are dissolved. The quantity of percolate which it is necessary to pass through the marc is usually from 180 cc. to 200 cc., which quantity will rarely be exceeded if the percolation has been successfully conducted. The estimation of the amount of alkaloids in this acid solution may be made in either of the following ways, viz:

1. The acid solution is precipitated by a *large excess* of caustic soda, which throws down a curd-like *white* precipitate. The precipitate is collected on a double filter,² and washed until the filtrate is nearly colorless. The whole of the filtrate is measured, and compensation made by adding to the weight of alkaloid, to be presently ascertained, 0.0585 gramme for every 100 cc. of the mother-liquor at temperature 15°C. The drained filter is carefully dried upon blotting-paper until the precipitate ceases to adhere, when it may be easily detached

¹ "Pharmaceutical Journal," September 13, 1884, p. 205.

² Doubling the filter facilitates the filtration.

without loss, and transferred to a small tared dish. It is now dried over a water-bath until it ceases to lose weight, and the weight is ascertained. Add the compensation above indicated for mother-liquor, multiply the sum by five, and the product is the percentage of alkaloids in the bark under examination.

The alkaline mother-liquor may now be used for ascertaining indirectly the percentage of cinchotannic acid. After exposure for two or three days in a shallow dish, by which the cinchotannic acid becomes converted into cinchona red,¹ the liquid is heated, and hydrochloric acid cautiously added to slight acid reaction. After cooling, the now turbid liquor is filtered through a double filter to collect the very voluminous precipitate of cinchona red. The precipitate is washed, dried, and weighed, the second filter being used as a tare.² By multiplying the ascertained weight of cinchona red by 1.2, a close approximation to the weight of cinchotannic acid is obtained, from which its percentage may be calculated, and it will be seen that the quantity of cinchotannic acid in different species of cinchona, and even in different samples of the same species, varies considerably.

2. The acid solution is mixed with excess of caustic soda as before, and well shaken in a bottle with 1 litre of commercial benzol, and left standing for not more than five minutes, for the benzol, which now contains the alkaloids in solution, to separate.³ The benzol solution is now decanted on a filter previously moistened with benzol, and the remainder is poured into a separating funnel. After sufficient time for separation, the red alkaline liquor is drawn off into the bottle previously used, and shaken with other 200 cc. benzol to remove possible traces of alkaloid, and this benzoic solution is also filtered and added to the former. The amount of alkaloids contained in the

¹ If the dark-red alkaline liquor becomes turbid during exposure to air the quantity of caustic soda is insufficient for solution of the newly formed cinchona red, and more soda must be added.

² Although I am opposed to drying precipitates upon the filter, it is unavoidable in this case, because the moist cinchona red cannot be conveniently removed.

³ A litre of benzol (boiling at from 85° to 120°C.) dissolves all the alkaloids of 20 grammes bark. By long standing, however, a slight separation of crystallized benzoate of alkaloid, chiefly cinchonine, may sometimes take place and affect the accuracy of the result. I, therefore, recommend that it should not be allowed to stand for more than 5 minutes. The benzol may be used repeatedly, without redistillation, and with but little loss.

mixed benzolic solutions may now be determined either directly or indirectly in the manner following, viz.:

Direct Determination.

The benzolic solution is shaken with 30 cc. very dilute nitric acid, the acid solution is drawn off and replaced by 20 cc. water, which is again shaken and added to the first. The liquors are heated to drive off traces of benzol, and when cool transferred to a separator and shaken with 200 cc. ether, and an excess of caustic soda. In this way *all* the alkaloids are dissolved by the ether,¹ leaving generally a slight brown film on the surface of the alkaline liquor, *which is almost entirely soluble in chloroform.*² After separating the ethereal solution a further 100 cc. ether is shaken with the alkaline liquor, and is then added to the first. By distillation of the ether, the whole of the alkaloids are left in a state of greater purity than I have ever obtained them by any other process.

Indirect Determination.

The benzolic solution is well shaken with 70 cc. deci-normal sulphuric acid. The acid solution is drawn off and replaced by 30 cc. water, which is again shaken and added to the other. The aqueous liquors are heated, and *accurately* neutralized by deci-normal solution of caustic soda until the color of reddened litmus is affected by it. The quantity of soda solution required for saturation is now to be deducted from 70 cc. (the equivalent of 70 cc. deci-normal sulphuric acid), and the difference multiplied by $\cdot 031$ ³ is the weight of alkaloid

¹ Whilst preparing this paper I found that the succirubra bark used in Bengal for the manufacture of cinchona febrifuge proved an exception to this rule; for, although the whole of the alkaloids are at first dissolved by the ether, a separation of small crystals of cinchonine quickly followed to the extent of 0.17 gramme. I attribute this to the large proportion of cinchonine contained in this bark, which I have found to amount to as much as 49.3 per cent. of the total alkaloids.

² This brown substance, *which is not alkaloid*, is the reason why analyses of bark, in which chloroform is the solvent, yield an apparent higher percentage of alkaloids.

³ 0.031 gramme is the weight of alkaloid corresponding to 1 cc. of a deci-normal solution. The molecular weight of the mixed alkaloids of cinchona bark being, as previously stated, 310.

in 20 grammes bark. This product multiplied by 5 gives the percentage.

Example.—Suppose the bark for analysis to contain 5 per cent. alkaloid—which would be a reasonable standard for pharmaceutical purposes—the acid solution from 20 grammes powder should be neutralized by, say, 37.5 cc. soda solution :

$$\text{For} \quad 70 - 37.5 \times 0.031 \times 5 = 5.04$$

(the number of grammes of alkaloid in 100 grammes bark).

I consider this indirect determination the most simple for those who are accustomed to work volumetric processes.

In concluding this paper it is satisfactory to me to be able to state that another chemist, very experienced in the analysis of cinchona bark, confirms the practicability of extracting the whole of the alkaloids by hydrochloric acid as effectually as by any other process. Mr. A. Kissel, chemical assistant to Dr. G. Kerner, in Zimmer's quinine manufactory, has kindly sent me the following results of analyses performed by him on the same bark powder by the several processes indicated, viz. :

	Lime and alcohol Process.	Lime and Oil Process.	Hydrochloric Acid Process.
Quinine.....	1.805	1.798	1.802
Quinidine.....	0.358	0.347	0.351
Cinchonidine.....	0.338	0.343	0.335
Amorphous.....	1.573	1.867	1.874
Total.....	4.374	4.355	4.362

I therefore consider that the extraction of alkaloids from cinchona bark by hydrochloric acid, as applied to the manufacture of the cinchona febrifuge in Bengal, provided it is properly performed, is not a wasteful, but, on the contrary, an economic and efficient process. It is, moreover (with the exception of an unpublished process, the private property of my friend, Dr. G. Kerner, which I am not at liberty to make known), the only process that can be profitably applied *in the tropics* to the manufacture of the total cinchona alkaloids.

VARIETIES.

STROPHANTIN was isolated by Hardy and Gallois, from the seeds of a species of *Strophantus*, an apocynaceous woody climber, used in preparing the arrow-poison *inā*. The principle forms colorless neutral crystals, is soluble in alcohol and water, and was ascertained to be a heart poison. Experiments made with it in Edinburgh, show it to be physiologically allied to digitalin; it has been used hypodermically in doses of $\frac{1}{120}$ to $\frac{1}{60}$ grain.

ESTIMATION OF QUININE IN MIXTURES OF QUININE-ALKALOIDS. By Y. Shimoyama.—The method described is founded on the relative solubilities of the oxalates of the quinine alkaloids: Quinine oxalate dissolves in 1,446 parts of water at 18°; cinchonidine oxalate in 228 parts at 15°; quinidine oxalate in 151 parts at 15°, and cinchonine oxalate in 104 parts at 10°. The precipitation is effected by adding sodium oxalate to a dilute neutral solution of the alkaloids, and correction must be made for the amount of quinine oxalate remaining in solution. — *Jour. Chem. Soc.*, Aug., 1885, p. 935; *Arch. Pharm.* [3], [23], 209-229.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 17, 1885.

On motion of Prof. Trimble, Mr. Wm. B. Thompson was called to the chair.

The minutes of the last meeting were read, and, there being no objection, they stand approved.

The Report of the Smithsonian Institution for 1883 was presented to the meeting, it having been received in the recess of the summer season, and not brought to the notice of the last meeting; it was accepted with thanks.

The Actuary read a paper upon *pill excipients*, and reactions which had been noticed in certain chemicals frequently prescribed in pillular form. The reading of the paper gave rise to an interesting discussion, in which Prof. Maisch, Mr. Lowe, Prof. Trimble, Mr. Thompson and the writer took part.

Mr. Thompson stated that a valuable lesson was to be drawn from the paper and the discussion, which was that pills should not be made with any excipient which merely suited the convenience of the dispenser, or served the purpose of causing the material to cohere into a mass that could be readily dispensed, but that each and every case must be decided by enlightened, thoughtful judgment; further, that it was a consideration what became of the immense quantities of wholesale-made goods that were annually disposed of in commerce.

Prof. Maisch stated that many years ago he had tried to find a suitable excipient for calomel pills, to be kept in stock, and his experience was then that it was best to make enough pills only for a few days' supply.

The use of extract of gentian was also discussed in its connection with the preparation of pills, and its promiscuous use objected to, both for chemical and therapeutical reasons. The paper was referred to the Publication Committee.

Prof. Maisch read a paper upon an indigenous *species of croton* received from Georgia, and showed under the microscope the stellate glandular scales from the leaves, branches, and from the silver-white flowers. The paper was referred to the Publication Committee, and the specimen donated to the cabinet.

A cabinet of botanical materia medica specimens, designed for the use of pharmaceutical students, was exhibited; it is put up by Parke Davis & Co., of Detroit, and contains 288 different drugs, packed in turned wooden boxes. Each box is numbered, and the catalogue accompanying the set gives the appropriate name, with its corresponding number.

Prof. Maisch stated that he was glad that such a cabinet, at a moderate price, was now accessible to students, many of whom had little opportunity in the stores of their employers of seeing all or most officinal drugs in their natural condition. In reply to a criticism that the odor of the wooden boxes in which the specimens are packed gave an odor to some of the drugs that is unnatural to them, Prof. M. stated that this taught the lesson to refrain from judging exclusively or mainly by the odor or taste, and to rely more upon the internal structure and characteristic growth.

There being no further business, the meeting adjourned.

THOS. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.—At the first social meeting, held Oct. 13th, Prof. Risley delivered a lecture on hyoscyamus, belladonna, and allied mydriatics, including also the alkaloids atropine, duboisine, hyoscyamine, homatropine, cocaine and others.

At the second social meeting, held Nov. 10th, Prof. Woodbury gave a lecture on the relations existing between practical medicine and pharmacy, and the debt which medical science owes to pharmacy.

WESTERN ALUMNI OF THE PHILADELPHIA COLLEGE OF PHARMACY.—In response to a generally expressed desire of the many graduates of the Philadelphia College of Pharmacy residing in the Western and Middle States, an informal meeting was held November 22d, in Chicago, to discuss the formation of a Western Alumni Association. There were present Albert E. Ebert, Henry C. C. Maisch, Edward A. Mannheimer, Carl S. Hallberg, Andrew J. H. McGuire, Chas. L. Feldkamp, and others, all residents of Chicago. It was stated that there were nearly fifty graduates of the College in Chicago and its immediate vicinity alone, while in the surrounding States the number would reach in the hundreds. It was the sense of the meeting that an organization through which an annual reunion could be held in Chicago about Commencement time (commencing next year, 1886), would be very desirable, and would keep alive the pleasant recollections of the Alma Mater with the older graduates, besides being of interest and profit to those who come westward after leaving the College.

It is not intended that this Association shall encroach in any manner upon the regular Alumni Association of the College, but simply to give all its graduates residing west of the Alleghenies, whether members of the Philadelphia Alumni Association or not, an opportunity of meeting socially once a year. To all graduates residing in the States of Ohio, Michigan, Indiana, Illinois, Kentucky, Missouri, Kansas, Nebraska, Iowa and Wisconsin a cordial invitation is extended to participate.

Another meeting will be held in Chicago shortly to make preliminary arrangements, and the Secretary will give any information to those desiring to join. Let there be a generous response.

CHARLES L. FELDKAMP, *Secretary*.

56 Beethoven Place, Chicago, Nov. 23, 1885.

THE CALIFORNIA PHARMACEUTICAL SOCIETY held its annual meeting in San Francisco, Nov. 12th. The Society has 144 active, five life and one honorary member. The receipts during the past year amounted to \$2,371.80; the disbursements were \$2,270.78; leaving a balance of \$101.02 in the treasury. A number of new members were elected. The Executive Officers for the ensuing year are: President, M. M. Searby; Vice-Presidents, Prof. H. Behr and Prof. Fred. Grazer; Corresponding and Financial Secretary, Chas. Troppmann; Treasurer, E. A. Schreck; Librarian and Curator, Dr. A. L. Scholl; Editor, Prof. W. T. Wenzell.

The Secretary is desirous to open correspondence with all pharmaceutical Societies in the United States for the interchange of opinions.

THE ILLINOIS PHARMACEUTICAL ASSOCIATION held its sixth annual meeting in Chicago, commencing Sept. 22d. Besides the address of the President and the reports of officers, reports on trade interests, on the pharmacy law, on drug adulterations, on non-official remedies, and on kindred subjects were received and fully discussed. Mr. T. H. Patterson, Chicago, was elected President for the ensuing year; Mr. T. N. Jamieson, Chicago, Secretary, and Mr. B. F. Gardner, Treasurer. The Association adjourned to meet in Rockford on the first Tuesday in June, 1886.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Textbook of Pharmacology, Therapeutics and Materia Medica. By T. Lauder Brunton, M.D., D.Sc., etc. Adapted to the United States Pharmacopœia by Francis H. Williams, M.D., Boston, Mass. Philadelphia: Lea Brothers & Co., 1885. 8vo, pp. 1035. Price, cloth \$5.50, leather \$6.50.

After a brief introduction, explanatory of the various subdivisions of the science of materia medica, the opening section treats of general pathology and therapeutics, explaining in a general way the manner in which drugs act upon different animals, the various organs and the secretions, the modifications in the effects under various conditions, the methods of administration, and the antidotes. The discussion of these subjects is particularly

adapted for the use of medical students, and while the details are comparatively brief, everything that seems to be of importance is treated with clearness, and when necessary explained by means of illustrations. The second section on Pharmacy gives brief explanations of the different groups of galenic preparations and lists of those recognized by the British and U. S. Pharmacopœias, with their doses. The following four sections, about 500 pages, treat of the medicinal agents, beginning with the elements and their inorganic compounds, which are followed by the organic compounds, excluding the active principles, these being considered in connection with the drugs from which they are derived. The vegetable and animal drugs are arranged in the natural orders of the plants and animals yielding them. For each drug the official name or names of the two pharmacopœias are given, explanations of the parts used, the habitat of the plant, brief characteristics of the drug, the official preparations with their doses, and an enumeration of the constituents. The physiological action, therapeutical uses, modes of administration, combination with other drugs, doses, antidotes and similar subjects of importance to physicians are discussed more in detail, in accordance with the scope of the work, which is intended as a textbook for the medical student, and to serve also as a book of reference in a condensed form. A limited number of the more important non-pharmacopœial drugs, like coto, quebracho, condurango, cheken, papayotin and others are considered in a similar manner. Besides the general index referring to the drugs and their effects, an index of diseases and remedies has been added, and a bibliographical index, which refers to the more important works and essays on the action and uses of the different remedies.

The work is doubtless a useful one. It contains nearly 200 illustrations, and that the general make-up is unexceptionable need merely be mentioned.

A complete pronouncing Medical Dictionary: embracing the terminology of medicine and the kindred sciences, with their signification, etymology and pronunciation. With an appendix comprising an explanation of the Latin terms and phrases occurring in medicine, anatomy, pharmacy, etc.; together with the necessary directions for writing Latin prescriptions, etc., etc. By Joseph Thomas, M.D., LL.D., etc. On the basis of Thomas's comprehensive pronouncing medical dictionary. Philadelphia: J. B. Lippincott Company, 1885. 8vo, pp. 844.

A work from the pen of the distinguished author, based upon a previous one, which has been received with merited commendation, may be expected to present characteristics which entitle it to special attention. In the first place should be mentioned its extent; scarcely a technical term or a scientific name used in medicine, pharmacy, and in medical chemistry and botany, has been overlooked, and all are explained as to their derivation and meaning, the correct pronunciation being indicated by an equivalent English spelling, if necessary, or more frequently by dividing the words into syllables, and in connection with accentuation marks and with signs indicating the proper sounds of the vowels and of some of the consonants. The names of a large number of natural orders, of genera and of species of

plants have been admitted, which have attracted more or less attention as remedies, or which are cultivated for ornament; usually the common name of the plant is also given, in addition to its habitat, the part used and the medical properties, thus affording concise references which will often prove quite convenient. Considering the multitude of plants which enjoy a local or more extended reputation, it is not to be expected that the names of all should have found a place here; indeed, omissions may usually be pointed out in works devoted especially to medical botany, and it is therefore no fault that occasionally the name of an American plant like *Mahonia* is not found, while others which are now rarely met with in medical or pharmaceutical literature have their allotted place. In very rare cases only, as far as we have examined the text, could we wish for corrections or for more exact explanations; thus on page 198 *Dryobalanops camphora* is said to be "the tree which affords camphor in greatest quantity," and on page 750 *triticein* is stated to be "the gluten of wheat." That the names of all drugs, chemicals and pharmaceuticals, recognized by the present or former Pharmacopœia are mentioned and explained with reference to the authority, falls very properly within the scope of the work, but we doubt the utility of giving working formulas for tinctures, troches and the like; it seems to us that for a pronouncing dictionary simple explanations are quite appropriate and sufficient, such as have been made use of for most of the extracts and fluid extracts. For example: *Extract. Colocynth. comp.* is defined to be "a preparation containing colocynth, aloes, cardamom and scammony" (and soap might have been added); *Extract. Gentianæ*, "an aqueous extract of gentian;" *Extr. Valer. fluid.*, "a fluid extract of valerian, one cubic centimetre representing one gramme of valerian;" the processes have been very properly omitted in these cases.

For some years past the word *official* has been used by some authors to denote such articles which are recognized by the pharmacopœias. Dr. Thomas, in not admitting this word, seems to consider the above application as being improper, with which view we coincide, preferring the adjective *pharmacopœial*, "of, or belonging to, a pharmacopœia," as defined by the author. His definition for *officinal* is "a term applied to such medicines as are directed by the colleges to be prepared or kept in shops."

Having thus spoken at length of the dictionary itself, and explained its great usefulness to the pharmacist and physician, as well as to the student, we can only briefly refer to the Appendix, the first eighteen pages of which, under the title of "explanation of Latin terms, phrases, etc.," give the rules and examples of the declension of nouns, adjectives and pronouns; the comparison, use and application of adjectives, etc., and contain several tables of nouns and adjectives, grouped together and selected with special reference to pharmacy and medicine.

The chapter "on writing prescriptions" addresses itself more particularly to the physician and medical student, with reference to the proper construction of prescriptions as far as language is concerned, and is followed by tables of doses, of chemical symbols, of the orders and families of the living mammalia, and of weights and measures.

It will be seen from the foregoing that this book possesses great value as

a lexicon, and is very useful also in other respects; as a work for frequent reference by the pharmacist, physician and student, it is heartily recommended.

Fownes' Manual of Chemistry, theoretical and practical. A new American from the twelfth English edition, embodying Watts' "Physical and Inorganic Chemistry." With 168 illustrations. Philadelphia: Lea Brothers & Co., 1885. 12mo, pp. 1056. Price, cloth, \$2.75; leather, \$3.25.

Nearly thirty-seven years have gone by since the original author of this work, George Fownes, died in the prime of his life, and although a number of revised editions have since been published, the author's name has been retained with them. But it is evident that with the rapid progress made during that period in physics and chemistry very little remains of the original work, so that its present shape is due to the literary labors of its principal reviser, Henry Watts. The death of the latter interrupted the labors of remodelling; however, a considerable portion having been accomplished, this, comprising physical and inorganic chemistry, was reviewed in last year's "Journal." The volume now before us consists of this portion, together with the organic chemistry revised a few years ago.

Applied Medical Chemistry. A manual for students and practitioners of Medicine. By Lawrence Wolff, M.D., Demonstrator of Chemistry, Jefferson Medical College, etc. Philadelphia: P. Blakiston, Son & Co., 1885. 8vo, pp. 174. Price \$1.50.

The necessity being admitted for medical men to possess a practical knowledge of chemistry in its various applications to medical science, a guide for laboratory work becomes very desirable, and this is well provided for by the work before us. It is divided into five parts, which treat of apparatus and manipulations, chemistry of poisons (poisonous metals and acids), physiological chemistry (pigments, carbohydrates, fats, etc.), excretions and concretions (urine, bile, feces), and sanitary chemistry (air, water, milk, flour, preserves, fermented liquors, pharmaceutical preparations). The arrangement is made in accordance with the author's system of demonstration, and we think will be found to be useful and convenient. The whole work is concisely written; the descriptions of compounds as well as of reactions, though designedly brief, give, as a rule, the important characteristics; yet some of the reactions would appear to deserve additional details, as for instance the difference between antimony and copper in the application of Reinsch's test. A very useful addition to each part is a syllabus of such operations and processes which the student should perform to thoroughly familiarize himself with the different subjects. The appendix contains a brief but valuable account of the ptomaines, a number of useful tables, and a good index.

The work will doubtless be productive of much good in acquainting the medical student with the essentials of such investigations which he may be called upon to perform as a part of his professional duties; and owing to its conciseness and accuracy will also prove of benefit to pharmacists and others who may not find it convenient to consult more extensive volumes on the characters and analysis of substances embraced within the scope of Dr. Wolff's book.

The Physician's Visiting List for 1886. Philadelphia: P. Blakiston, Son & Co.

This is the thirty-fifth yearly issue, and as heretofore is published in several sizes.

The Medical News Visiting List, 1886. Philadelphia: Lea Brothers & Co.

This visiting list makes its appearance for the first time, we believe, and in its red seal binding and gilt edges is quite attractive. Though the pages are somewhat wider and longer than has been customary with similar publications, it is neither unhandy for being carried in the pocket, nor inconvenient for ready use as a memorandum book. The 48 pages of printed text contain, among others, lists of incompatibles, antidotes and doses, a therapeutic table, and directions for the ligation of arteries, for the use of disinfectants, for the examination of urine, etc. The tables of weights and measures are supplemented by a graphic chart, showing at a glance the correct equivalents of centimeters and inches, of grains and decigrams, of drachms or ounces and grams, of minims, fluidrachms or fluidounces and cubic centimeters, and of the degrees of the centigrade and Fahrenheit thermometer scales. About 200 blank pages, suitably arranged, are intended for the necessary records of a practice aggregating thirty patients per day. This visiting list is published at the price of \$1, and is provided with patent thumb-letter index for rapid use, at 25 cents additional.

Proceedings of State Pharmaceutical Associations for 1885.

The following reports of meetings held during the present year, of which condensed accounts were published in our July number, have been received, in addition to those previously noticed :

Alabama; pp. 26. The fifth annual meeting will be held at Birmingham, on the second Tuesday of May, 1886; G. M. Bains, local secretary.

Indiana; pp. 113. The fifth meeting will take place at Lafayette, at the call of the Executive Committee; David Hilt, local secretary.

Kentucky; pp. 54. The ninth meeting will convene at Bowling Green, on the first Wednesday in May, 1886; Wm. Turner, corresponding secretary.

Louisiana; pp. 54. The fourth meeting will assemble in New Orleans, on the third Wednesday in April, 1886; Mrs. E. Rudolf, corresponding secretary.

Maryland. Proceedings for 1884, pp. 58; for 1885, pp. 58. The fourth meeting will convene in Annapolis, on the first Tuesday in June, 1886; M. L. Byers, Hagerstown, secretary.

Nebraska; pp. 43. The fifth meeting will be held in Omaha, on the second Tuesday in May, 1886; Chas. J. Danbach, local secretary.

New York; pp. 324. The eighth meeting will take place in Rochester, on the second Tuesday of June, 1886; C. H. Haskin, local secretary.

Ohio; pp. 157. The eighth meeting will be held in Springfield, June 2, 1886; Chas. Ludlow, assistant secretary.

Pennsylvania; pp. 182. The ninth meeting will convene in Lebanon, on the second Tuesday in June, 1886; Geo. R. Ross, assistant secretary.

Virginia; pp. 81. The fifth meeting will assemble in Alexandria, on the second Tuesday of May, 1886; Edgar Warfield, local secretary.

Wisconsin; pp. 87. The seventh meeting will take place at Fond du Lac, August 10, 1886; F. M. Givings, local secretary.

Grundlagen der Pharmacognosie. Einleitung in das Studium der Rohstoffe des Pflanzenreiches. Von F. A. Flückiger und A. Tschirch. Berlin: Julius Springer, 1885. Svo, pp. 257.

Principles of Pharmacognosy. Introduction into the study of the crude products of the vegetable kingdom.

When the first edition of this work made its appearance, in 1873, it was duly noticed in this Journal; and now, on the publication of the second and enlarged edition, we may refer to what we then said concerning the importance of such a treatise as a guide in the preliminary study of history, preceding the study of vegetable drugs.

In this new edition the arrangement of the material remains in the main as before, and it is chiefly in the details that differences are observed, not merely in incorporating the results of the more recent investigations, but also in the enlarged scope.

The first part of the work, relating to the study of materia medica in general, has been revised and rewritten by Prof. Flückiger, in his usual clear and comprehensive manner. The second part of the work, relating to morphology and anatomy, has been rewritten and materially enlarged by Prof. Tschirch. After considering the various morphological parts of plants, such as roots, rhizomes, wood, bark, leaves, etc., the remaining portion, about two-thirds of the work, is devoted to vegetable anatomy, beginning with the cell, its contents, the cell wall, the cell forms, etc., and passing then to the different tissues, keeping in view, besides the anatomical structure, also the physiological functions of the same. The different conditions of the tissues, and the development of the various forms, are explained and illustrated almost exclusively from officinal drugs, or from parts of plants in which officinal secretions or excretions are produced; the study of vegetable anatomy is thus invested with peculiar interest to the student of materia medica. A brief chapter on pathological growths, galls, and another on micro-chemical reagents conclude the work.

The subject matter of the work, the lucid and attractive manner of its treatment, the literary references, and the handsome illustrations (186 in number), all combine to make the work a most valuable one; and we are pleased to learn that it is likely to become also accessible to those who are not conversant with the German language, since Prof. F. B. Power has undertaken its translation into English.

Milk Analysis and Infant Feeding. A practical treatise on the examination of human and cows' milk, cream, condensed milk, etc., and directions as to the diet of young infants. By Arthur V. Meigs, M.D., etc. Philadelphia: P. Blakiston, Son & Co., 1885. 12mo, pp. 102. Price, in cloth, \$1.

From a large number of analyses made by the author the conclusion is arrived at that normal human milk has an alkaline reaction, and contains about 1 per cent. of casein, the average composition of the milk of forty-three women being water 87.163, fat 4.283, casein 1.046, sugar 7.407 and ash

-101. Based upon these results and upon the composition of ordinarily good milk and cream, which are easily procurable in most cities, the infants' food is recommended to be prepared by mixing two tablespoonfuls of cream, one of milk, two of lime water and three of sugar water, the latter to be prepared by dissolving $17\frac{3}{4}$ drachms of pure milk sugar in 1 pint of water.

Tracts on Massage. No. II. The physiological effects of Massage. Translated from the German of Leibmayr, with notes, by Benjamin Lee, A.M., M.D., etc. Philadelphia, 1885. Pp. 46. Price 25 cents.

The tract shows that the object of massage is to arouse the normal physiological processes of the organism to increased activity, to excite a more vigorous tissue-transformation and interchange, and to reduce congestions and inflammations; and that it is also the most efficient means of promoting the absorption of all pathological products and deposits which can be thrown back into the general circulation without risk to the system.

Fourth Annual Report of the Illinois Board of Pharmacy; with Abstract of State Pharmacy Register. Springfield, Ill., 1885. 8vo, pp. 200.

The Board consists of Geo. Buck, Chicago; John E. Espey, Bloomington; Herman Schroeder, Quincy; Albert E. Ebert, Chicago, and Charles W. Day, Springfield.

Second Annual Report of the State Agricultural Station at Amherst, Mass. Boston, 1885. 8vo, pp. 166.

New York Cancer Hospital. First annual report. 1885.

Duty of the State to the Medical Profession. An address delivered before the Medical Alumni Association of the University of Michigan, June 24, 1885, by Conrad George, M.D., Ann Arbor, Mich. Pp. 11.

Reprint from the "Physician and Surgeon."

An Address on Cholera Infantum. By William Perry Watson, A.M., M.D., Jersey City, N. J. Pp. 21.

Reprint from "Archives of Pediatrics."

The Therapeutics of high temperatures in young children. By William P. Watson, A.M., M.D., Jersey City, N. J.

Reprint from "Archives of Pediatrics."

Observations on several Zoogloee and related forms. By William Trelease, Sc.D. Pp. 24.

Reprint from "Studies from the Biological laboratory of the John Hopkins University," Vol. III.

The spot disease of Strawberry leaves, Ramularia Tulasnei, Sacc. By Wm. Trelease. Pp. 20.

From the second annual report of the Wisconsin Agricultural Experiment Station.

A Manual of Weights, Measures and Specific Gravity, including principles of metrology; the weights and measures now in use; weight and volume, and their reciprocal relations; weighing and measuring; balances (scales) and weights; measures of capacity; specific weight and specific volume and their determination and practical applications; with rules and tables. By Oscar Oldberg, Pharm.D., Professor of Pharmacy and director of the pharmaceutical laboratory of the Chicago College of Pharmacy. Chicago: published by the Author, 1885. 8vo, pp. 238.

The confusion which has heretofore existed in medical metrology has been, to a considerable extent, done away with by the gradual introduction of the metric system in most civilized countries. It cannot be denied that this system in English-speaking countries has not yet gained a popular foothold to such a degree as had been anticipated by its more sanguine advocates; but it should also be remembered that in France where the system was perfected and first legally introduced, forty or fifty years were necessary before it was thoroughly understood and used by the general public, while at the present time scientists throughout the whole world are not only familiar with it, but employ it in their investigations. We, therefore, regard its general use merely as a question of time. This would probably be favored, if existing weights were so far modified as to have a simple relation to the metric units; at any rate an accurate relation is as desirable as between the units of weight and measure in common use.

In Great Britain the imperial fluidounce in use, at 62°F., contains exactly one avoirdupois ounce = 437½ troygrains of water; but neither the multiples nor the subdivisions agree between weight and measure, or have any simple relation to the troygrains, except that the imperial gallon is equal to 10 avoirdupois pounds or 70,000 troygrains. The wine measure in use in the United States shows no such relation to either avoirdupois or to troyweight; but the subdivisions of the fluidounce adopted for medical and pharmaceutical use, correspond to the subdivisions of the troyounce, though, necessarily, there cannot be a simple equivalent between the corresponding weights and measures. To secure such a simple relation the author proposes that the ounce be made equal to 32 grams and the fluidounce to 32 cubic centimeters; by dividing these into eight parts, the drachm would be equal to 4 grams and the fluidrachm to 4 cubic centimeters. Discarding the scruples the units would then be the gram and the cubic centimeter or fluigram, and by dividing these into sixteen parts, the grain and the minim would be obtained, differing but very slightly from the same medicinal weights as at present used. Without materially altering the present values, a simple relation would be established between apothecaries' weights and measures and between these and the metric system, and at the same time the larger units could be repeatedly divided by two without fractions until the new grain and new minim were reached. A fluidounce of water at its greatest density would then weigh exactly one (new) ounce; but if it was made to weigh that at a medium temperature of 20° or 22°C., the volume would be about ¼ per cent. greater than 32 cubic centimeters.

The volume deserves to be carefully read and considered by physicians and pharmacists, even though the reader may not agree with all the views advanced by the author.

OBITUARY.

HENRY B. PARSONS, one of the most talented and indefatigable of the younger American chemists, died August 21st, at Tucson, Arizona, aged 30 years. He was born in Syria, where his father was stationed as a missionary, and was educated in the United States, graduating as Pharmaceutical Chemist from the University of Michigan in 1876. He retained his connection with the University as assistant in the school of pharmacy for the following two years, and for the next three years accepted the position of Assistant Chemist in the Agricultural Department at Washington, occupying also for one session the chair of *Materia Medica* and Botany in the National College of Pharmacy. In 1881 he removed to New York, to take charge of the laboratory of W. H. Schieffelin & Co., and subsequently became editor of the "Druggists' Circular." In these various positions, as well as a member of the Committee of Revision of the Pharmacopœia, of the New York College of Pharmacy, of the New York State Pharmaceutical Association, and of the American Pharmaceutical Association, he did the work assigned to him thoroughly and well. His sound knowledge, his skill as an experimenter, and his clearness as an observer, had opened for him a career of usefulness, which, measured by the results of the past, gave greater promise for the future, and his modest and genial disposition secured him a large circle of sincere friends.

DR. WILLIAM BENJAMIN CARPENTER, the eminent physiologist, died in London, November 10th, at the age of 72, from the effect of burns caused by the upsetting of a spirit lamp while he was taking a vapor bath for rheumatism. He was widely known as an author on human and comparative physiology and through his researches on the Foraminifera, and other low forms of life. He paid a visit to the American Pharmaceutical Association, at its meeting at Niagara Falls, in 1882.

Notice of the death of the following Graduates of the Philadelphia College of Pharmacy has been received :

WILLIAM CARLTON BOYNTON, class 1884, died at his residence, in Auburn, Me., August 5, 1885, of typhoid fever. He had been a student at the Jefferson Medical College for one term.

FRANKLIN S. GARMAN, class 1872, died July 1, 1884, at his home in Lykens, Pa.

JEFFERSON OXLEY, class 1872, died at Nicholasville, Ky., October 11, 1885, of consumption, aged 43 years. As a subject for his thesis he investigated *Gaultheria* and *Epigæa*, and proved in the leaves the presence of arbutin and urson, which principles are now known to exist in many ericaceous plants. He was an ex-president of the Kentucky Pharmaceutical Association.

JOHN N. SHOFFNER, class 1868, died near Loudonville, O., August 24, 1885, from the effect of a wound received near Haley, Idaho. He was formerly in business in Bethlehem, and his remains were interred at his native place, Norristown.

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